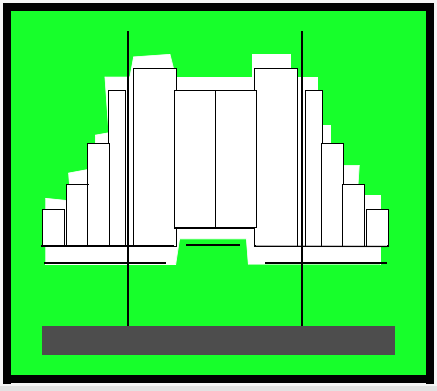
SmartSwitch 9000/9500 Series



Supports Multiple Management Modules

APRISMA SPECTRUM® POWERED SOLUTIONS

Device Management

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Introduction

This section introduces the SPECTRUM Device Management documentation for the SmartSwitch 9000/9500 Series of devices manufactured by Cabletron.

This introduction contains the following topics:

- *Purpose and Scope*
- *Required Reading*
- *Supported Devices* (Page 8)
- *The SPECTRUM Model* (Page 17)

Purpose and Scope

Use this document as a guide for managing the Cabletron devices described on Page 8 with the SPECTRUM management modules listed in Table 1. This document describes the icons, menus, and views that enable you to remotely monitor, configure, and troubleshoot Cabletron devices through software models in your SPECTRUM database.

Information specific to the SmartSwitch 9000/9500 Series of devices is what is primarily included in this document. For general information about device management using SPECTRUM and explanations of SPECTRUM functionality and navigation techniques, refer to the topics listed under *Required Reading*.

Required Reading

To use this documentation effectively, you must be familiar with the information covered by the other SPECTRUM online documents listed below.

- ***Getting Started with SPECTRUM for Operators***
- ***Getting Started with SPECTRUM for Administrators***
- ***How to Manage Your Network with SPECTRUM***
- ***SPECTRUM Views***
- ***SPECTRUM Menus***
- ***SPECTRUM Icons***
- ***SPECTRUM Software Release Notice***

Supported Devices

Table 1 displays the supported devices for the SS9000/9500 chassis.

Table 1: Supported Devices

Part Number	Module Description	SPECTRUM Model Type
SM-CSI1030	*Ethernet MicroLAN Switch Modules* (Page 11)	9E132_15 9E133_36 9E138_12 9E138_36
SM-CSI1031	*FDDI Switch Module* (Page 14)	9F116_01
SM-CSI1032	*FDDI MicroLAN Modules* (Page 14)	9F120_08 9F122_12 9F125_08 9F241_12
SM-CSI1035	*FDDI SmartSwitch Modules* (Page 14)	9F310_02 9F426_02 9F426_03
SM-CSI1036	*Ethernet SmartSwitch INB 2 Modules* (Page 11)	9E312_12 9E423_24 9E423_36 9E428_12 9E428_36 9E429_12 9E429_36

Table 1: Supported Devices

Part Number	Module Description	SPECTRUM Model Type
SM-CSI1038	*Token Ring MicroLAN Switch Modules* (Page 15)	9T122_24 9T122_08 9T125_24 9T125_08
SM-CSI1055	6-port enet switching module	9E106_06
SM-CSI1059	*ATM Access Modules* (Page 10)	9A128_01 9A426_01 9A426_02
SM-CSI1066	*Fast Ethernet INB Modules* (Page 13)	9H421_12 9H422_12 9H423_26 9H423_28 9H429_12
SM-CSI1073	*SmartCell Switches* (Page 16)	9A656_04 9A686_04
SM-CSI1074	*Gigabit Ethernet SmartSwitch Modules* (Page 15)	9G421_02 9G426_02 9G429_02
SM-CSI1083	*Token Ring SmartSwitch Module* (Page 15)	9T425_16 9T427_16 9T428_16
SM-CSI1092	*Carrier Module* (Page 16)	9M426_02

Table 1: Supported Devices

Part Number	Module Description	SPECTRUM Model Type
SM-CSI1098	*Dual INB Modules* (Page 12)	9H5xx 9G5xx 9E5xx
SM-CSI1100	Generic 9000 Module	Gen9000

The SmartSwitch 9000/9500 Series consists of a 6 and 14 module chassis, an Environmental module, a Flexible Network Bus (FNB), a high speed Internal Network Bus (INB), and over 30 different types of modules. Depending on the modules installed, the SmartSwitch 9000 will support the technologies listed below. The modules associated with these technologies are explained in their respective section.

- Ethernet (Page 11)
- Fast Ethernet (Page 13)
- Gigabit Ethernet (Page 15)
- Token Ring (Page 15)
- FDDI (Page 14)
- ATM (Page 10)

Note: The SmartSwitch 9500 is the same as the 9000 with the exception that it requires a CTM upgrade kit in order to make use of the 9A656-04 and 9A686-04 modules.

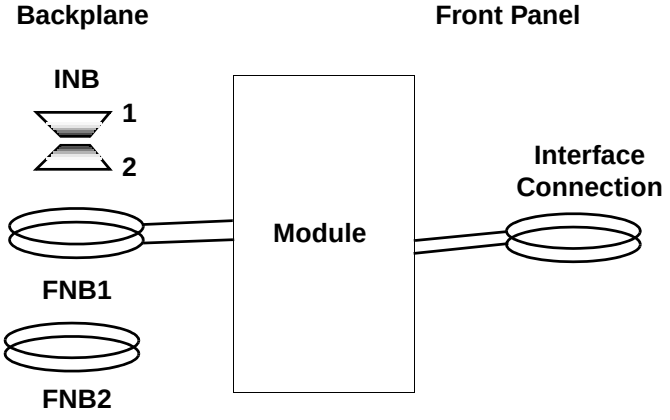
The SmartSwitch 9000/9500 utilizes a packet- and cell- switching backplane to transfer information throughout your network. Figure 1 shows a representation of the relationship between the front panel interfaces and the backplane for each module installed in the SmartSwitch 9000/9500 chassis.

The components that make up the backplane are:

- The FNB consisting of two dual FDDI networks; the FNB1 and the FNB2
- The INB which is divided into two channels; INB1 and INB2

Note: Throughout this manual the SmartSwitch 9000/9500 Series will be referred to as the SmartSwitch 9000 Series.

Figure 1: **Front Panel/Backplane Relationship**



Connection Between FNB1 and the Front Panel

Module Descriptions

The following modules are available for the SmartSwitch 9000 Series:

ATM Access Modules

An ATM Access module is a device that is capable of providing connectivity between FDDI or ATM networks and the INB, the FNB or both.

The following are supported devices of ATM Access modules:

- The 9A128_01 connects an external ATM network to one of the two FDDI networks on the FNB backplane.
- The 9A426_02 connects two external ATM networks to either the INB backplane, the FNB backplane or both.
- The 9A426_01 connects one external ATM network to either the INB backplane or the FNB backplane.

Ethernet MicroLAN Switch Modules

The Ethernet MicroLAN Switch Module is a four channel Ethernet to FDDI bridge. Up to three front panel Ethernet networks can be connected to this module. These networks can be bridged to any other Ethernet or FDDI segment, and to any other MMAC-Plus card via the FNB bus. The Ethernet MicroLAN device is equipped with an advanced Intel i960 microprocessor that provides a platform for all management functions within a scalable RISC-based architecture. Three 50-pin front panel ports provide 12 individual Ethernet connections each. All ports function as repeaters, for incoming data which retime and retransmit all packets. Bridging between the front panel channels and/or to any other module in the chassis is done via FDDI ring 1 or FDDI ring 2 of the FNB bus.

The following devices of Ethernet MicroLAN Modules are supported:

- 9E106_06 MicroLAN
- 9E132_15 MicroLAN Switch Extension
- 9E133_36 MicroLAN
- 9E138_12 MicroLAN (fiber optic)
- 9E138_36 MicroLAN (fiber optic)

Ethernet SmartSwitch INB 2 Modules

The Ethernet SmartSwitch INB 2 Modules are Ethernet switching modules that provide Ethernet networks with connectivity to the SmartSwitch 9000 INB 2.

The following devices of Ethernet SmartSwitch INB Modules are supported:

- The 9E312_12 has 12 10Base-T front panel ports supported by RJ-45 style connectors.
- The 9E423_24 has 24 10Base-T front panel ports supported by RJ-71 style connectors.
- The 9E423_36 has 36 10Base-T front panel ports supported by RJ-71 style connectors.
- The 9E428_12 has 12 10Base-T front panel ports supported by ST connectors.
- The 9E428_36 has 36 10Base-T front panel ports supported by ST connectors.
- The 9E429_12 has 12 10Base-T front panel ports supported by ST connectors.
- The 9E429_36 has 36 10Base-T front panel ports supported by ST connectors.

Dual INB Modules

Dual INB Modules make use of both INB 1 and INB 2 backplanes. When a Dual INB board is inserted into the backplane, the chassis makes a determination as to which backplane it will attach to. This is done by checking the loads on both INBs and the INB with the least amount of traffic will be the one the board communicates with. The speed at which the backplane is running will depend upon the speed of the slowest board.

The following devices of Dual INB Modules are supported:

- The 9H531-17 is a high-performance Fast Ethernet module for the SmartSwitch 9000, providing 16 100Base-FX ports via MTRJ interfaces, and one VHSIM interface that can support ATM, Gigabit Ethernet, FDDI and WAN connectivity.
- The 9H531-18 is a high-performance Fast Ethernet module for the SmartSwitch 9000, providing 16 100Base-FX ports via MTRJ interfaces. In addition, the 9H532-18's GPIM slot can also be populated with a variety of media types, including switched 1000Base-SX/LX Gigabit Ethernet.
- 9H531-24 is a high-performance Fast Ethernet module for the SmartSwitch 9000,providing 24 100Base-Fx ports via MTRJ interfaces.
- The 9H532-17 is a high-performance Fast Ethernet module for the SmartSwitch 9000, providing 16 auto-negotiating 10/100Base-TX ports via RJ45 interfaces. In addition, a VHSIM interface can support ATM, Gigabit Ethernet, FDDI and WAN connectivity.
- The 9H532-18 is a high-performance Fast Ethernet module for the SmartSwitch 9000, providing 16 auto-negotiating 10/100Base-TX ports via RJ45 interfaces. In addition, the 9H532-18's GPIM slot can also be populated with a variety of media types, including switched 1000Base-SX/LX Gigabit Ethernet.
- The 9H532-24 is a high-performance Fast Ethernet module for the SmartSwitch 9000, providing 24 100Base-FX ports via MMF Mini MTRJ connectors.
- The 9H533-24 is a high-performance Fast Ethernet module for the SmartSwitch 9000, providing 24 10/100Base-TX ports via RJ45 interfaces.

- The 9H539-24 is a high-performance Fast Ethernet module for the SmartSwitch 9000 providing 24 100Base-FX ports via SMF Mini MTRJ connectors.
- The 9G536-04 is a Gigabit Ethernet module next generation SmartSwitch with four switched gigabit ethernet ports via GPIMs.
- The 9E423-24 is an Ethernet module providing 24 front panel interfaces that support two RJ-21 (Telco) connectors.

Fast Ethernet INB Modules

Fast Ethernet INB Modules are Fast Ethernet switching modules providing Ethernet networks with connectivity to the SmartSwitch 9000's INB2.

These modules occupy a single slot in the chassis.

You may model the Fast Ethernet INB Module at the Topology level, or as part of a LAN. One device may be attached to each of the Fast Ethernet INB Module's interfaces.

The following devices of Fast Ethernet INB Modules are supported:

- The 9H421-12 module has 12 fixed MMF (Multimode Fiber) SC front panel connections with connection to the INB2 backplane.
- The 9H422-12 module provides 11 fixed RJ-45 connections for category 5 twisted pair, and one media-flexible interface to accept either an additional RJ-45 or a MMF or single-mode fiber SC interface via the Fast Ethernet Port Interface Module.
- The 9H423-26 is a Fast Ethernet module with INB-2 connectivity. It Consists of 24 ports via 2 RJ21 Connectors, and 2 ports via 2 MMF SC Connectors.
- The 9H423-28 is a single module offering connectivity for 24 switched Ethernet segments and up to four switched Fast Ethernet connections. It supports media flexibility for both Fiber Optic Fast Ethernet backbone and Twisted Pair server/workstation connections.
- The 9H429-12 features 12 fixed single mode front panel interfaces and provides connectivity to the INB 2 backplane.

FDDI SmartSwitch Modules

The FDDI SmartSwitch Module (9F310-02, 9F426-02 and 9F426-03) connects two external FDDI networks to a high speed switching backplane, the INB. The external FDDI networks connect to the FDDI SmartSwitch Module using standard FDDI Dual Attached Station (DAS) A/B ports.

The FDDI SmartSwitch Modules operate in two modes: as Bridging or as a SecureFast Switch (SFS). The FDDI SmartSwitch Modules are able to accept variable-size LAN packets, translate them into a generic form for transmission to other front panel ports, and segment them into fixed length data blocks for time division multiplexed transmission over the INB backplane to other Fast Packet Switched based modules.

FDDI Switch Module

The FDDI Switch Module (9F116-01) is a two-port FDDI bridge used to connect an external FDDI network with one of the two FDDI networks, FNB 1 or FNB 2; or to connect between FNB 1 and FNB 2 on the FNB backplane. The external FDDI network connects to the FDDI Switch Module using a Dual Attached Station (DAS) interface via standard FDDI Medium Interface Connectors (MIC) on the front panel.

FDDI MicroLAN Modules

The FDDI MicroLAN Modules are a family of concentrators providing eight or twelve master ports for connections to a Single or Dual Attached Station. Modules attach directly to the SmartSwitch 9000 FNB.

The following devices of FDDI MicroLAN Modules are supported:

- The 9F120-08 is an eight-port FDDI dual channel concentrator via MMF MIC with dual FNB attachments.
- The 9F122-12 is a twelve-port FDDI dual channel concentrator via UTP RJ-45 with dual FNB attachments.
- The 9F125-08 is an eight-port FDDI dual channel concentrator via SMF MIC with dual FNB attachments.
- The 9F241-12 is a twelve-port FDDI dual channel concentrator via MMF SC with FDDI bandwidth statistics and dual FNB attachments with dual MAC.

Gigabit Ethernet SmartSwitch Modules

The Gigabit Ethernet SmartSwitch Modules (9G426-02, 9G421-02, and 9G429-02) are single slot devices that connect to the INB backplane to integrate connectivity to ATM, FDDI, and Fast Ethernet. They feature traditional switching services as well as Cabletron's SecureFast Virtual Networking, embedded Virtual Routing, optional RMON support, and Broadcast Storm Protection on every port. The devices provide two front panel slots that can accommodate SC connectors offering MMF and SMF connection options. The 9G421-02 and 9G429-02 devices support the IEEE draft 802.3 specification for Gigabit Ethernet.

Token Ring MicroLAN Switch Modules

The TR MicroLAN Switch Modules (9T122-08 and 9T122-24) provide connectivity to two TR networks through the FDDI backplane in the chassis. The TR MicroLAN Switch Module's single 24-port Token Ring, or two 12-port Token Rings use standard RJ-45 connectors supporting either Unshielded Twisted Pair (UTP) or Shielded Twisted Pair (STP) lobe wiring. The rings interconnect across the chassis's FNB, a dual 100 Mbps FDDI backplane, and can be configured for FNB-1 or FNB-2.

The 9T125-08 and 9T125-24 provide connectivity for two individual Token Ring networks. The rings interconnect across the FNB, and can be configured for FNB-1 or FNB-2.

Token Ring SmartSwitch Module

Designed specifically for collapsed Token Ring backbones, the 9T425-16 and 9T428-16 Token Ring SmartSwitches occupy two slots, and the 9T427-16 occupies one slot in the chassis. The 9T428-16 has 16 switched multimode fiber ports supported by ST connectors. The 9T425-16 and 9T427-16 are equipped with 16 copper RJ-45 Dedicated Token Ring (DTR) lobe/station ports, also known as concentrator or C-ports.

These modules are considered a "hard card," with all switching functions performed by the Fast Packet Switch (FPS Application Specific Integrated Circuits ASICs). The TR SmartSwitch Modules attach to the INB 2 backplane and have System Management Bus -1 (SMB-1) and SMB-10 connections for system management.

SmartCell Switches

The SmartCell switch module (9A656-04 and 9A686-04) is a single-slot, hot-swappable module for the SmartSwitch 9000. Each module provides 4.5 Gbps of ATM Switching fabric with 64K cell output buffers that provide priority queuing and the ability to communicate with other SmartCell switches via a unique Cell Transfer Matrix (CTM) backplane.

Note: A CTM upgrade kit is required for use with the 9A656-04 and 9A686-04 modules.

Each switch module holds up to four ATM Network Interface Modules (ANIMs). There are several different ANIMs available for these modules that provide interfaces ranging from 45 Mbps up to 622 Mbps. ANIM options include DS-3/E-3 over coaxial cable, OC-3 over unshielded twisted pair, multi and single mode fiber, OC-12 over multi and single mode fiber, and OC-48 over single mode fiber. This interface flexibility permits scaling to even higher speeds in the future. All physical interfaces--DS3, OC-3, and OC-12 and higher--support UNI and PNNI as well as all relevant ATM standards.

Carrier Module

The 9M426-02 Carrier Module for the SmartSwitch 9000 combines voice, video, and data. Technologies such as Frame Relay and Gigabit Ethernet are integrated into the same switching chassis. The 9M426-02 provides securefast support for layer 3 switching as well as port trunking for established load sharing.

Occupying two slots in the SmartSwitch 9000 chassis and equipped with two HSIM interfaces, each capable of supporting a wide variety of flexible LAN, WAN, or ATM options, the 9M426-02 is specifically designed for high-speed, translational switching in the data center.

Note: Since the Carrier Module (9M426-02) does not represent a specific-technology, it is not discussed in any of the technology sections nor is it represented in any of the model type tables.

The SPECTRUM Model

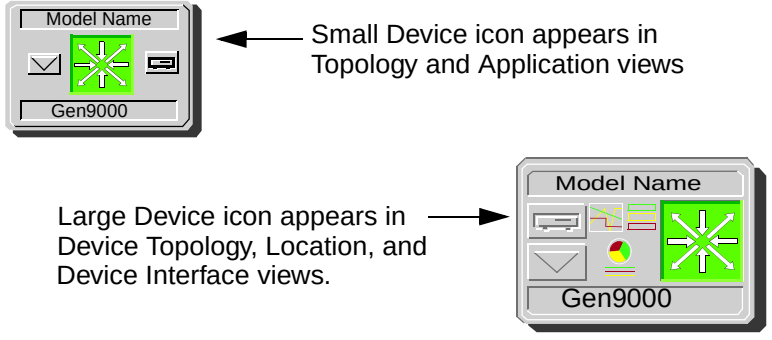
The model types for the Cabletron devices appear in Table 1 (Page 8).

Modeling results in the creation of Device icons that represent the devices and Application icons that represent their supported applications.

The Device icons contain double-click zones and provide access to Icon Subviews menus that let you perform device management activities such as those listed in *Tasks* on Page 18.

As Figure 2 shows, the appearance of the Device icons varies slightly depending on the kind of view it appears in.

Figure 2: Device Icons


Model Name
Gen9000
Small Device icon appears in Topology and Application views
Large Device icon appears in Device Topology, Location, and Device Interface views.
Model Name
Gen9000

The rest of the documentation for these management modules is organized according to view type, as follows.

- *Tasks* (Page 18)
- *Device View* (Page 20)
- *FDDI* (Page 51)
- *Token Ring* (Page 64)
- *ATM* (Page 88)
- *Ethernet* (Page 139)
- *Modeling Considerations* (Page 142)
- *Manual Modeling* (Page 145)

Tasks

This section identifies various management and troubleshooting tasks that can be performed for the SmartSwitch 9000/9500 using the views, icons, and label referenced within this document.

ATM Link Information

- *ATM Client Application Configuration View* (Page 92)

Chassis Information (examine)

- *Chassis Device View* (Page 24)

Enable or Disable a Port (configure)

- Ethernet *Admin Status* (Page 49)
- FDDI *Port Action* (Page 58)
- Repeater *Network Ports* (Page 60)
- Token Ring
  - *Enable All Ring Ports* (Page 69)
  - *Enable All Station Ports* (Page 69)

FNB Backplane (configure)

- *FNB Backplane View* (Page 27)

Model Information (examine)

- *Model Information View* (Page 50)

Modeling a SmartSwitch 9000 (configure)

- *Modeling Considerations* (Page 142)
- *Manual Modeling* (Page 145)
- *Modeling the Chassis* (Page 146)
- *Modeling the Modules in the Chassis* (Page 149)
- *Quick Steps* (Page 149)

Monitor Interface or Port Operation

- *ATM Interface Detail View* (Page 93)
- Ethernet *Interface Status Label* (Page 26)
- Repeater *Port Status Label* (Page 54)
- FDDI *Port Status Label* (Page 55)
- Token Ring *Port Status Label* (Page 67)
- *SMB 1 and SMB 10 Icons* (Page 31)
- *FNB 1 and FNB 2 Icons* (Page 31)
- *INB 1 and INB 2 Icons* (Page 32)

Port Configuration (examine/modify)

- *Device Configuration View* (Page 48)

- *Port Configuration - CSIIf Port View* (Page 49)
- *Interface Device View* (Page 20)

Setting Repeater Traps and Alarms

- *Trap Configuration* (Page 60)
- *Alarm Configuration* (Page 61)

Setting Ring Alarms and Thresholds

- *TR Ring Configuration View* (Page 70)
- *Token Ring Security Configuration View* (Page 72)
- *Configure Station Alarms* (Page 81)
- *Station Alarms Dialog Box* (Page 82)

Setting Token Ring Security

- *Modify Allowed Station List View* (Page 85)

Device View

This section describes the Device view and subviews available for models of Cabletron devices in SPECTRUM.

Device Views

These views display icons and labels that represent the device, its ports or interfaces, and its applications. SmartSwitch 9000 devices support two types of device views:

- *Interface Device View*
- *Chassis Device View* (Page 24)

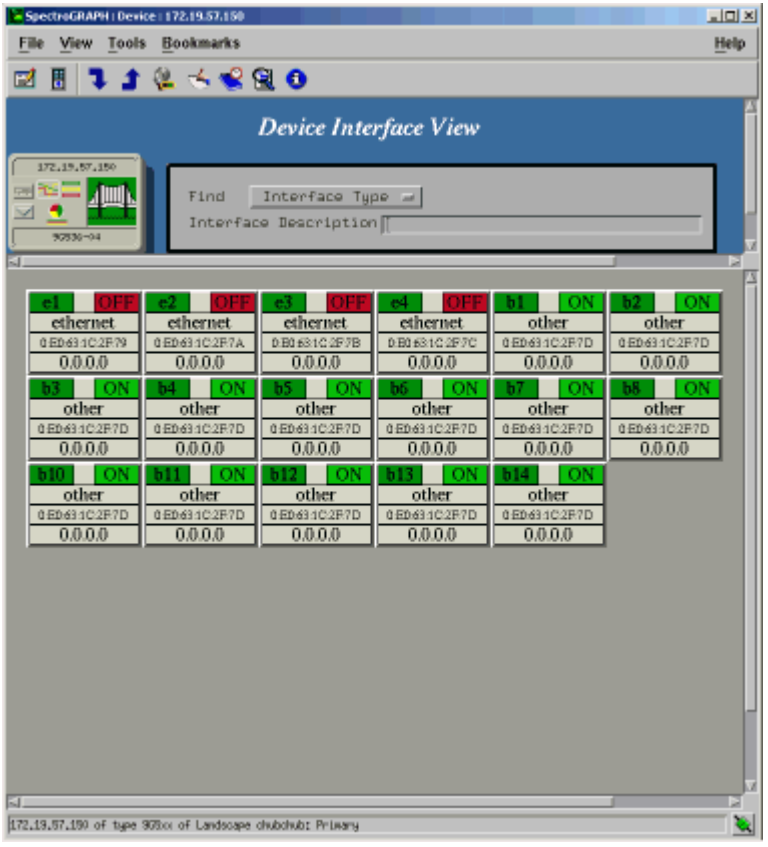
The Device Chassis view can be configured four different ways including: Chassis, Environmental, Physical, and Backplane.

Interface Device View

Access: *From the* ***Icon Subviews*** *for the a SmartSwitch 9000/9500 icon, select* ***Device > Interface.***

This view provides dynamic configuration and performance information for each of the device's serial/network I/O ports, which are represented by Interface icons in the bottom panel of the view, as shown in Figure 3 (Page 21).

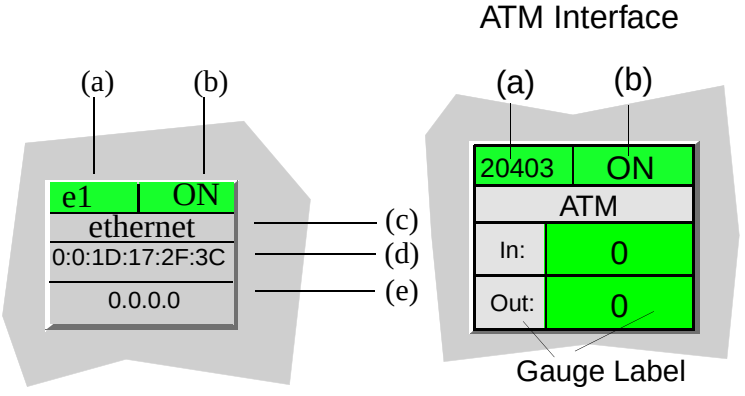
Figure 3: Interface Device View


SpectroGRAPH : Device : 172.19.57.150
File View Tools Bookmarks Help
Device Interface View
Find Interface Type
Interface Description
e1 OFF ethernet 0:E0:63:1C:2F:79 0.0.0.0
e2 OFF ethernet 0:E0:63:1C:2F:7A 0.0.0.0
e3 OFF ethernet 0:E0:63:1C:2F:7B 0.0.0.0
e4 OFF ethernet 0:E0:63:1C:2F:7C 0.0.0.0
b1 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b2 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b3 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b4 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b5 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b6 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b7 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b8 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b10 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b11 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b12 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b13 ON other 0:E0:63:1C:2F:7D 0.0.0.0
b14 ON other 0:E0:63:1C:2F:7D 0.0.0.0

Interface Icons

Figure 4 shows a close-up of an Interface icon from an Interface Device view. Most of the informational labels on the icon also provide double-click access to other views, as explained in the following label descriptions.

Figure 4: Interface Icon



- **a** *Interface Number Label*
- **b** *Interface Status Label*
- **c** *Port Type Label*
- **d** *MAC Address Label*
- **e** *IP Address Label*

Interface Number Label

This label displays the number identifying this interface. The first number represents the slot that this module resides in. The second number represents the interface number on this module.

Interface Status Label

This label displays the current Operational Status of the interface. It also provides double-click access to the *Port Configuration - CSIIf Port View* (Page 49).

Table 2 and Table 3 list the possible states relative to the application selected. The default application for this view is Physical (MIB-II).

Table 2: Interface Status for the Physical Application

Color	Status	Description
Green	ON	Port is operational.
Blue	OFF	Port is off.
Yellow	TST	Port is in the test mode.

Table 3: Administrative Status for the Bridging Application

Color	Status	Description
Green	FWD	Bridge port is forwarding.
Blue	DIS	Port is disabled.
Magenta	LST	Bridge is in the listening mode.
Magenta	LRN	Bridge is in the learning mode.
Orange	BLK	Bridge port is in the blocking mode.
Red	BRK	Bridge port is broken.
Blue	???	Status is unknown.

Port Type Label

This label displays the type of network interface module.

MAC Address Label

This label displays the physical (MAC) address of the interface. Double-click the label to open the Interface Address Translation table, which cross-references network addresses (IP addresses) to physical (MAC) addresses for selected nodes between networks. Double-clicking on any column entry opens an address-specific Address Translation Table Information view. This view provides the same information as the

corresponding row for the IF Address Translation table, but allows you to modify field values.

IP Address Label
This label displays the IP address for the interface. Double-click this label to open the *Secondary Address Panel* (Page 23), which lets you change the address and mask for the interface.

Interface Icon Subviews Menu Selections

Table 4 describes each of the Icon Subviews menu selections, available from the interface icon, that are available to all or most of the devices available to the SmartSwitch 9000 Series. Depending on the device type. Some of these views may not be available.

Table 4: Interface Icon Subviews Menu Selections

Option	Opens the...
Sub-Interface	Sub-Layer Information view. (See ***SPECTRUM Views***).
Configuration	*Port Configuration - CSIIf Port View* (Page 49).
Secondary Address Panel	Secondary Address Panel View.
Thresholds	Interface Threshold view, which lets you set the on/off alarm thresholds for load, packet rate, error rate, and % discarded for the interface.
Model Information	*Model Information View* (Page 50).

Secondary Address Panel

Access: *From the **Icon Subviews** menu for the Interface icon in the Device view, select **Secondary Address Panel**.*

This panel provides a table of IP addresses and masks obtained from the Address Translation table within the device's firmware. You can change the current address displayed in the **IP Address** field by selecting an entry from the table in this panel and clicking the **Update** button.

Chassis Device View

Access: *From the **Icon Subviews** for the Device icon of the SmartSwitch 9000/9500, select **Device > Chassis**.*

Figure 5 is common to all devices available within the SmartSwitch 9000 and displays the Module Icon that represents the Physical Devices and their placement in the chassis. These Module icons vary depending upon the device and are explained in their appropriate technology section.

Figure 5: Chassis Device View

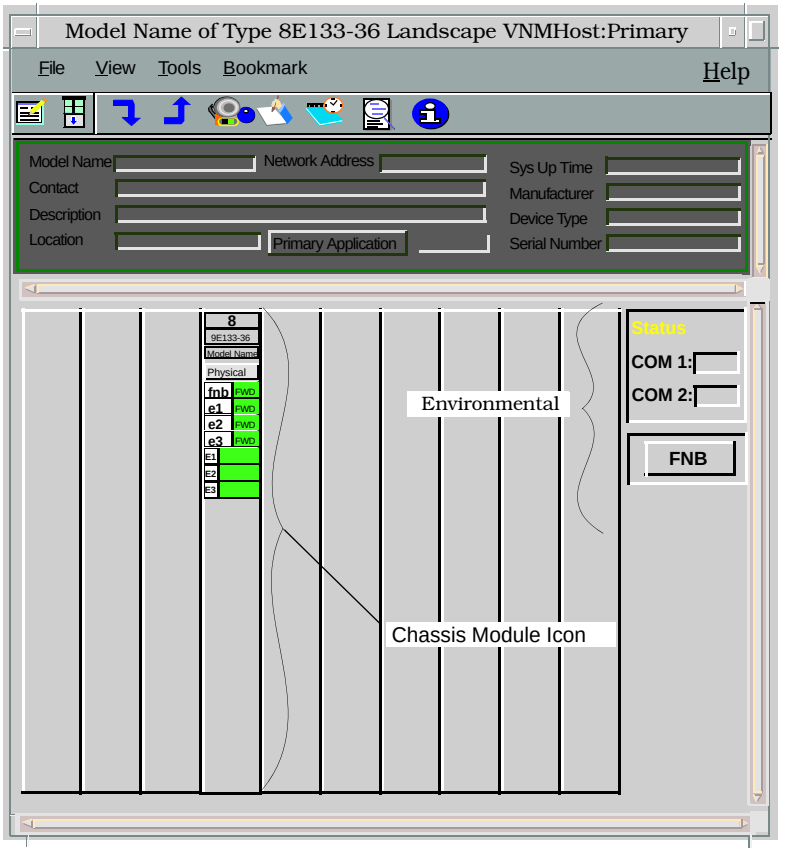
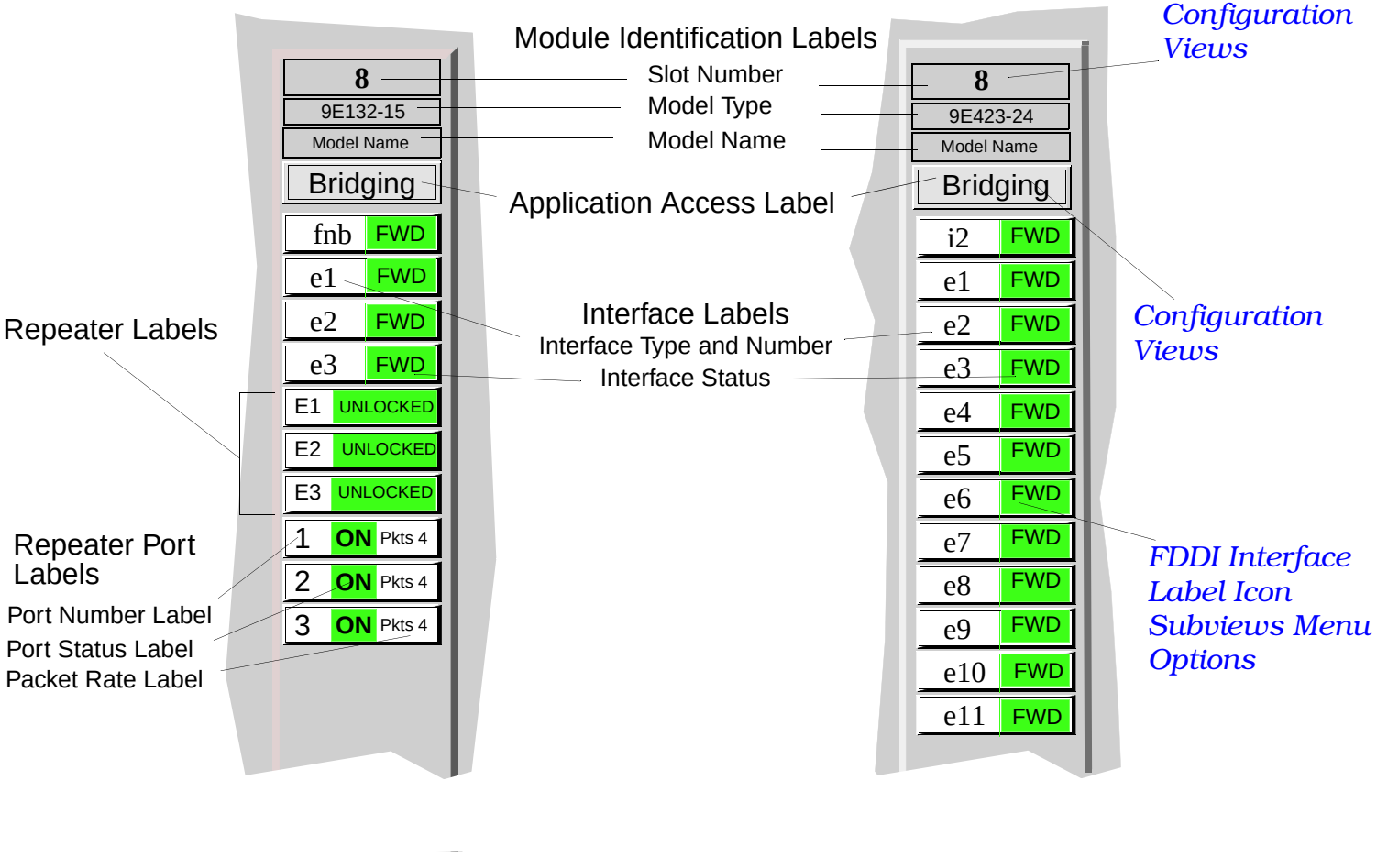


Figure 6: Ethernet Chassis Module Icon



Chassis Module Icon

Figure 6 displays a logical representation of the physical module icon, its location in the chassis, and its front panel interfaces or ports.

Note: The Chassis Module icon representing each device will have no basic components. Some devices may have different labels depending on the application running, front panel interfaces, and device type.

Module Identification Labels

These labels display the following information:

Slot Number Label
This label displays the location of the module within the chassis.

Model Type Label
This label displays the type of network interface module in the chassis slot.

Model Name Label
This label displays the type of network interface module in the chassis slot.

Application Access Label
This label displays the application running on the device and provides double-click access to the CSI Performance view.

Interface Labels

These labels display the following information:

Interface Type and Number Label
The number and type for this interface.

Interface Status Label
The current operating status of this interface.

Chassis Module Icon Subviews Menu Selections

Table 5 lists each of the Icon Subviews menus common to the Chassis Module for each device within the SmartSwitch 9000 chassis. These views are described in ***SPECTRUM Views***. A summary and example for each view is provided within this section.

Table 5: Common Chassis Module Icon Subviews Menu Selections

Options	Opens the...
DevTop	*Device Topology View* (Page 40).
Application	*Application Views* (Page 41).
Configuration	*Configuration Views* (Page 47).
Model Information	*Model Information View* (Page 50).
Interface	*Interface Device View* (Page 20).
Application Display	Application selection dialog box. This dialog box allows you to select the application to be displayed in the Application label. Example: Bridging.

FNB Backplane View

Access: *From the Chassis or Backplane Device View, click on the* ***FNB*** *button.*

The FNB Ring Configuration window (Figure 7) lets you make the most effective use of network bandwidth for your site by allowing you to segment the SmartSwitch 9000 FNB into smaller FDDI ring networks.

The window acts as a template for your network design. You can use it to try out changes to the network design before you actually apply them. After you have reconfigured the network to your needs, you can apply the changes.

Figure 7: FNB Backplane View

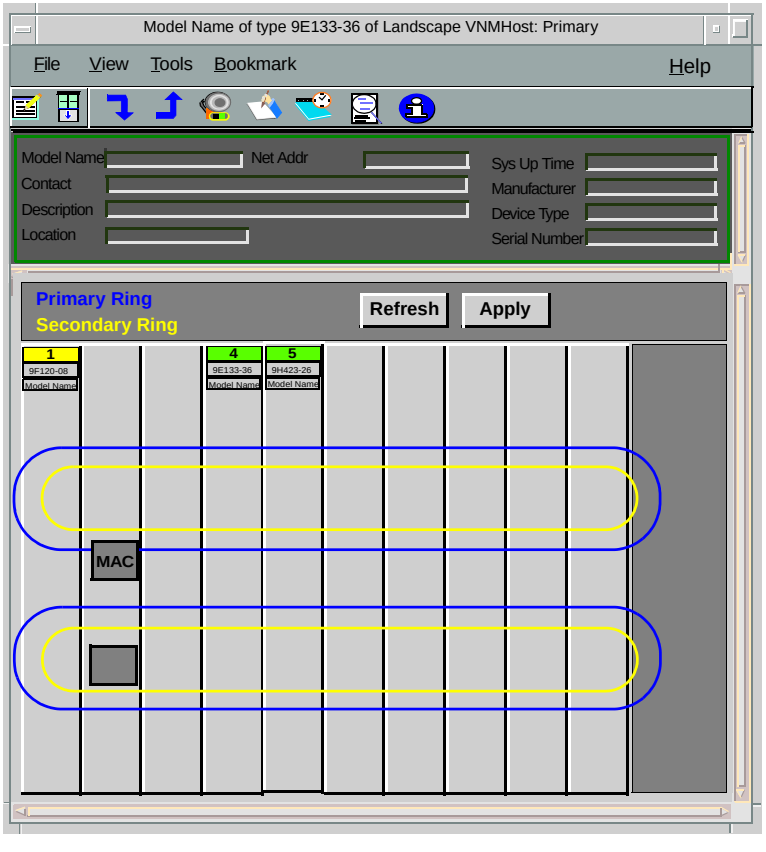


Table 6 lists the Icon Subviews menu for the FNB Backplane.

Table 6: FNB Backplane Icon Subviews Menu Selections

Options	Opens the...
FNB-1 Thru	Unwraps to the original state of primary and secondary rings.
FNB-1 Wrap Left	Wraps the module's FNB left multiplexer so that the primary and secondary paths of FNB-1 are looped, causing a single ring to form.
FNB-1 Wrap Right	Wraps the module's FNB right multiplexer so that the primary and secondary paths of FNB-1 are looped, causing a single ring to form.
FNB-2 Thru	Unwraps to the original state of primary and secondary rings.
FNB-2 Wrap Left	Wraps the module's FNB left multiplexer so that the primary and secondary paths of FNB-2 are looped, causing a single ring to form.
FNB-2 Wrap Right	Wraps the module's FNB right multiplexer so that the primary and secondary paths of FNB-2 are looped, causing a single ring to form.

Backplane Device View

Access: *From the Chassis, Environmental, or Physical view, select* ***View > Page > Backplane****.*

Figure 8 shows a logical representation of the backplane connections (FNB, INB and SMB) for each of the modules installed in the chassis. An example of a backplane icon, its double-click zones and Icon Subviews menus is discussed in the following pages. The backplane module Icon will be the same for every device with the exception that the backplane icons (i.e., INB, FNB, SMB) will be grayed out depending on the functionality of the device.

Figure 8: Backplane Device View

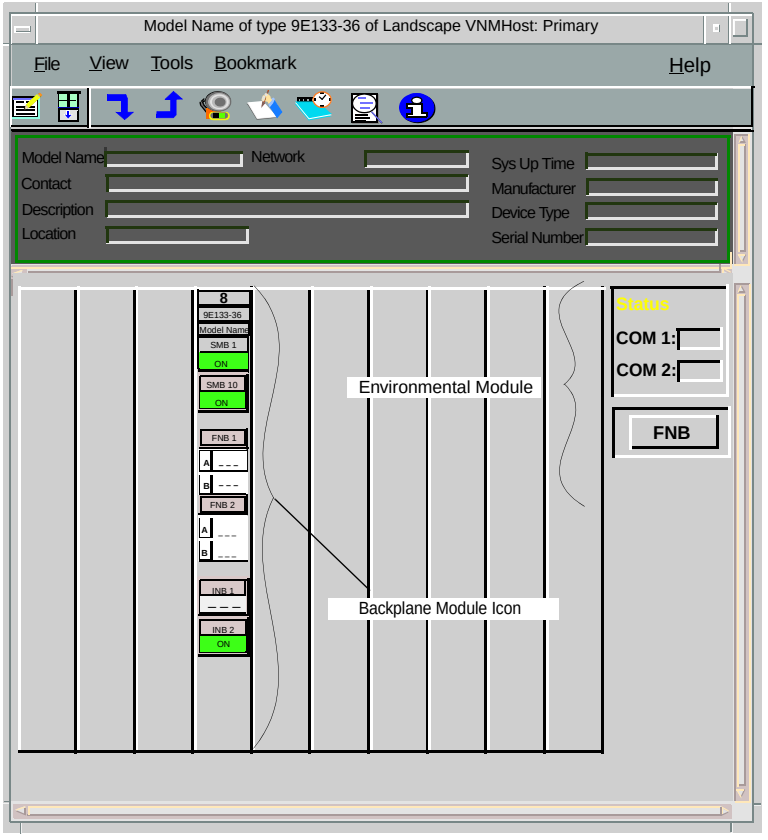
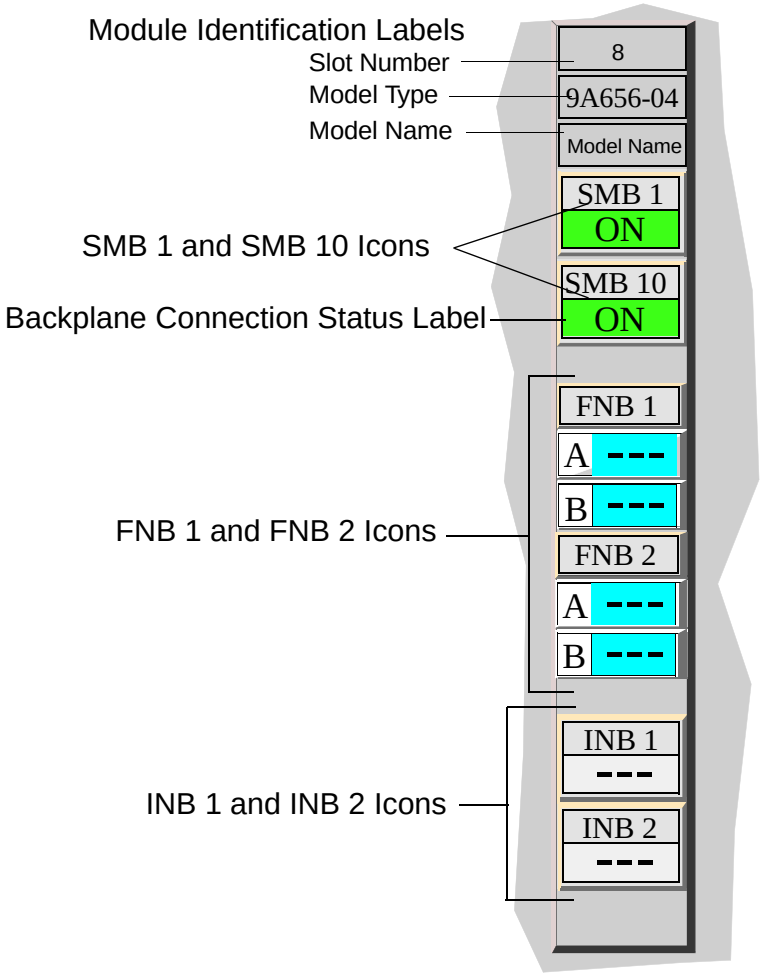


Figure 9: **Backplane Module Icon**



Backplane Module Icon

This icon displays a logical representation of the physical module, its location in the chassis, its backplane interfaces and its ports. Figure 9 shows an example of the Backplane Module icon.

Module Identification Labels

These labels display the following information:

Slot Number Label

This label displays the location of the module within the chassis.

Model Type Label

This label displays the type of network interface module in the chassis slot.

Model Name Label

This label displays the type of network interface module in the chassis slot.

SMB 1 and SMB 10 Icons

The System Management Bus (SMB) icons represent the connections between the module and the SMB 1 and SMB 10. Table 7 describes the possible operational states.

Table 7: SMB 1 and SMB 10 Status Descriptions

Color	Status	Description
Blue	OFF	The module is not connected to the SMB.
Green	ON	The module is connected to the SMB.
Yellow	TST	The interface is in the test state.
Grey	- - -	The interface could not be found for this module.
Red	- - -	Problems have occurred reading and determining the status of the interface.

FNB 1 and FNB 2 Icons

The Flexible Network Bus (FNB) icons (see Figure 9 on Page 30) represent the connections between the module and the FNB 1 and FNB 2. Table 8 describes the possible operational states.

Table 8: FNB 1 and FNB 2 Status Descriptions

Color	Status	Description
Blue	---	The module is not connected to the FNB but has the potential to be connected.
Blue	DIS	The module is disabled.
Yellow	CON	The module is in the process of connecting to the FNB.
Green	ACT	The module is connected to the FNB and is active.
Red	SBY	The module is in standby mode.
Red	---	Problems have occurred reading and determining the status of the interface.

Table 9: INB 1 and INB 2 Status Descriptions

Color	Status	Description
Blue	OFF	The module is not connected to the INB.
Green	ON	The module is connected to the INB.
Yellow	TST	The interface is in the test state.
Grey	- - -	The interface for this module could not be found.
Red	- - -	Problems have occurred reading and determining the status of the interface.

INB 1 and INB 2 Icons

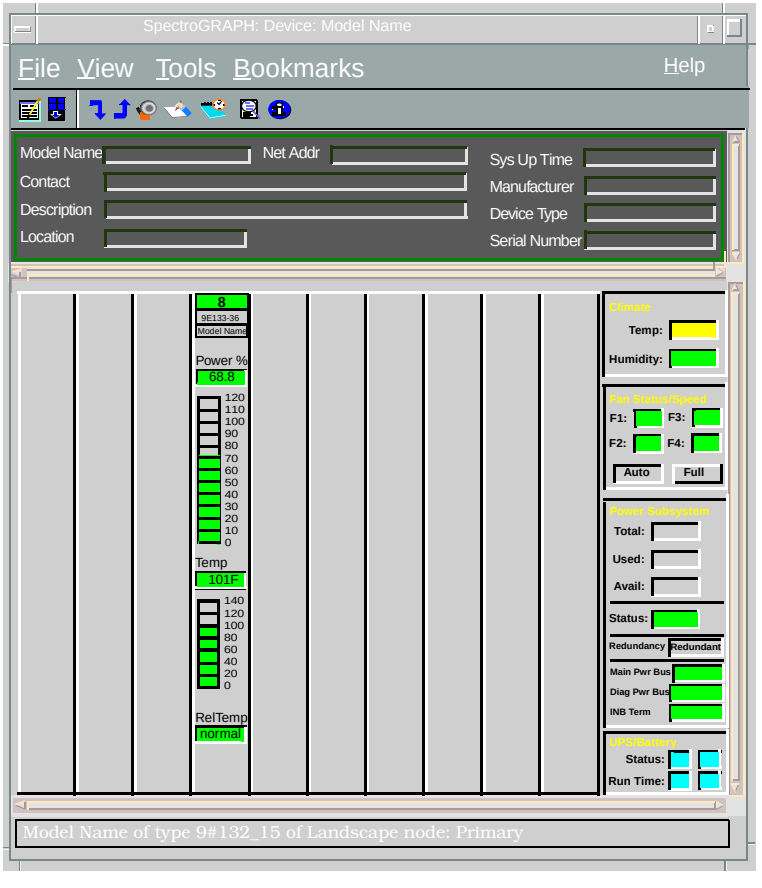
The Internal Network Bus (INB) icons (see Figure 9 on Page 30) represent the connections between the module and the INB 1 and INB 2. Table 9 describes the possible operational states.

Environmental Device View

Access: *From the Chassis, Backplane, or Physical view, select* ***View > Page > Environmental****.*

This view displays the temperature in Fahrenheit or Celsius (selectable from the **Options** menu) and power levels for the devices installed in the chassis. Figure 10 shows an example of an Environmental Device view.

Figure 10: Environmental Device View



Chassis Environmental Information

This area of the Device view also indicates the environmental status of the chassis. These panels and their fields are as follows:

Climate

- **Temp** - displays the ambient temperature of the room in which the chassis is located.
  - Green - normal, cool, or cold
  - Yellow - warm
  - Red - hot
  - Blue - unknown
- **Humidity** - displays the humidity value of the air flowing through the chassis.
  - Green - dry, normal, or moist
  - Blue - unknown

Fan Status/Speed

- **F1** through **F4** - displays the fan speed in percent of maximum speed for each of the four fans in the chassis.
  - Green - normal, or testing
  - Yellow - unknown
  - Red - slow, inoperative, or off
- **Auto/Full** - allows you to set the fans to **Auto** (speed controlled by the temperature of the chassis) or **Full** (speed set to maximum).

Power Subsystem

- **Total** - displays the maximum power that could be supplied by the chassis power supply.
- **Used** - displays the total power currently being supplied by the chassis power supply.
- **Avail** - displays the available power from the chassis power supply.
- **Status** - displays the status and type of power for the chassis: AC, DC, or Battery.
  - Green - power normal.
  - Yellow - over current, over voltage, or under voltage.
- **Redundancy** - displays the source of the power for the chassis.
  - Redundant - indicates that power from the secondary power source is being used for the chassis.
  - NON-Redundant - indicates that power from the primary power source is being used for the chassis.
- **Main Pwr Bus** - displays the voltage of the chassis's main power bus. The value can range between 40 and 60 volts DC.
  - Green - power normal.

- Yellow - over current, over voltage, or under voltage.

- **Diag Pwr Bus** - field does not function at this time. A future version of firmware will include this functionality.

- **INB Term** - displays the voltage of the termination power bus. The termination power bus provides power to the INB termination cards within the chassis.
  - Green - power normal.
  - Yellow - over current, over voltage, under voltage, or over power.

UPS/Battery

- **Status** - displays the UPS's operational status. Below are a list of colors and conditions associated with this field.
  - Red - overload, low battery, or replace battery.
  - Blue - no UPS.
  - Green - on line.
  - Yellow - calibration running.

- **Run Time** - displays the estimated remaining run time in minutes. You can query the UPS when operating on-line, bypass, or on-battery modes of operation. The run time estimate is based on available battery capacity and output load.

UPS Details View

Access: *From the **Icon Subviews** menu for the UPS/Battery section of the Chassis Device View, select **UPS Details**.*

This view provides the following information on the UPS battery.

Index
An unique value that identifies a particular UPS.

Name
The name of the UPS.

Model Type
The model type of the UPS.

Battery Capacity
The UPS's remaining battery capacity expressed as a percent of the fully charged condition. The value of this object is the actual percentage multiplied by 10.

Operational Status
The operational status of the UPS. Possible entries are: `on-line`, `on-battery`, `overloaded`, `low battery`, `replace battery`, `smart boost`, `sleep`, and `run time calibration running`.

UPS Configuration Information View

Access: *By double clicking on an entry in the* ***UPS Detail view****.*

This view displays information on the condition, status and the input/output power of a particular UPS. This view contains the following:

Identification

This section of the UPS Configuration Information View contains entries that uniquely identify a particular UPS.

Index
A unique value which identifies a particular UPS.

Name
A name given to a particular UPS.

Model Type
The UPS's base model type.

Firmware
The UPS's firmware version.

Serial Number
The UPS's serial number as set at the factory.

Manufacture Date
The UPS's date of manufacture, in the format mm/dd.

Status

The Status section of the UPS Configuration Information view displays information on the operational and fault status of a particular UPS.

Operational
The operational status of the UPS. Possible entries are: `on-line`, `on-battery`, `overloaded`, `low battery`, `replace battery`, `smart boost`, `sleep`, and `run time calibration running`.

Fault
The fault conditions. The possibilities are: `current`, `exceeded`, `malfunction`, `operation`, and `shut down`.

Temperature
The UPS's present internal operating temperature in degrees Fahrenheit. You can determine the actual temperature by dividing this value by 10.

Battery Conditions

This section of the UPS Configuration Information view contains the following information.

Capacity (%)
The UPS's remaining battery capacity as expressed by a percent of the fully charged condition.

Voltage
The UPS's present battery voltage. You can determine the actual voltage by dividing the value of the field by 100.

Run Time Remaining (min)
The UPS's estimated remaining run time (in minutes). The UPS can be queried when operating in on-line, bypass, or on-battery modes. The run time estimate is based on available battery capacity and output load.

Battery Test

The section of the UPS Configuration Information view contains information on the last battery test performed on this UPS.

Initiate Battery Test
Indicates if a battery test has been initiated. Valid values are: `Yes` and `No`.

Test Result
The results of the last battery test performed.

Input/Output Power

This section of the UPS Configuration Information view contains information on the incoming and out-going power that the UPS is providing. Column headings are as follows:

Input Voltage
The UPS's measured utility input voltage. The value is determined by dividing the value of the field by 10.

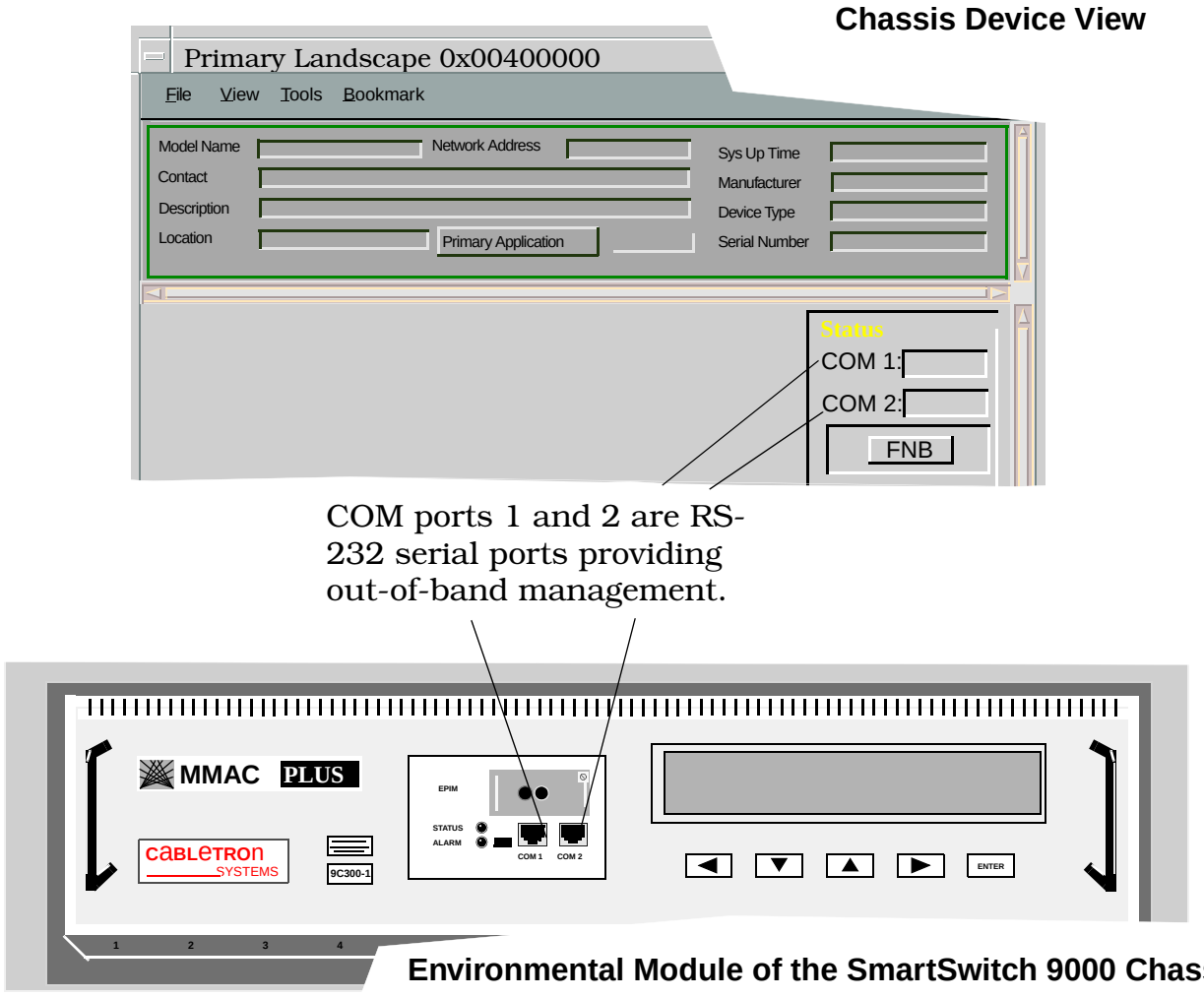
Output Voltage
The measured UPS output voltage. The value is determined by dividing the value of the field by 10.

Output Power (Watts)
The UPS's output load expressed as a percentage of rated load in watts.

Environmental Module Information

Within the Device Chassis view are the COM 1, COM 2, and the FNB fields which provide additional information for the connections on the Environmental Module. Figure 11 shows the relationship between the Device view and the corresponding front panel of the Environmental Module of the SmartSwitch 9000 chassis.

Figure 11: Environmental Module



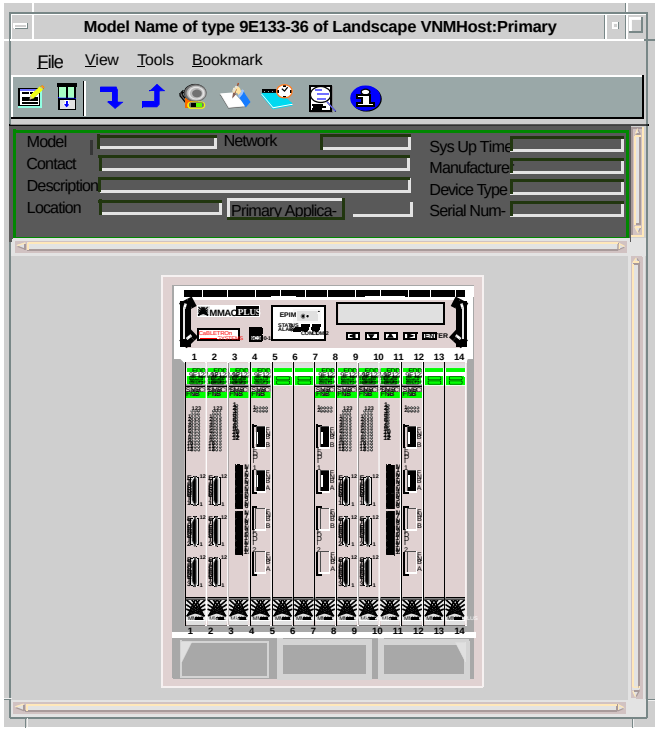
Environmental Module of the SmartSwitch 9000 Chassis

Physical Device View

Access: *From the Chassis, Environmental, or Backplane view, select* ***View > Page > Physical****.*

This view (Figure 12) provides a static image of the chassis, ports, and modules installed in the chassis.

Figure 12: Physical Device View



Device Topology View

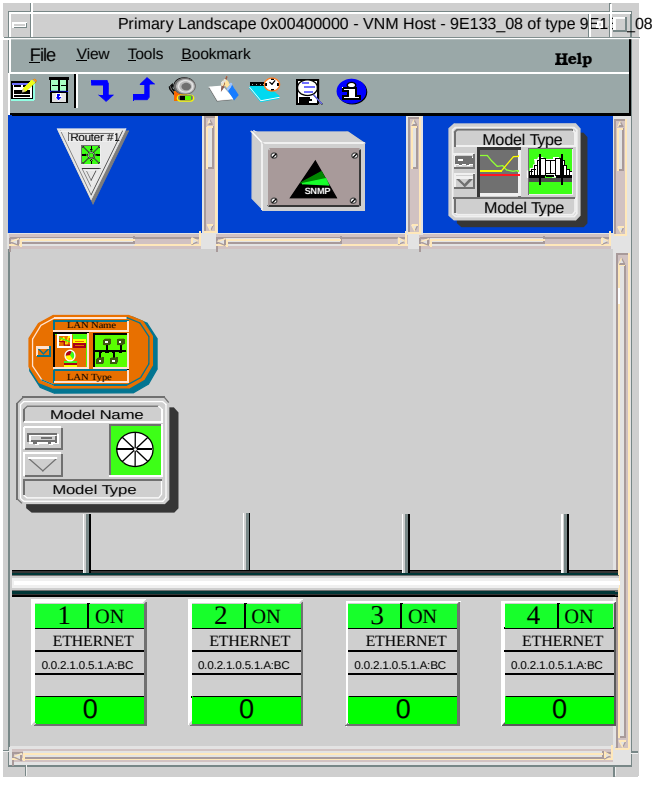
This section describes the Device Topology view available for models of Cabletron devices.

Device Topology View

Access: *From the* ***Icon Subviews*** *for the Device icon, select* ***DevTop****.*

Figure 13 displays icons that represent the device, its ports or interfaces, and the devices and LAN networks that contain those devices connected to its ports. It is described in ***SPECTRUM Views***. The Interface icons displayed in this view are the same as those in the Interface Device view.

Figure 13: Device Topology View



Application Views

This section describes the main Application view and the associated application-specific subviews available for models of Cabletron devices in SPECTRUM.

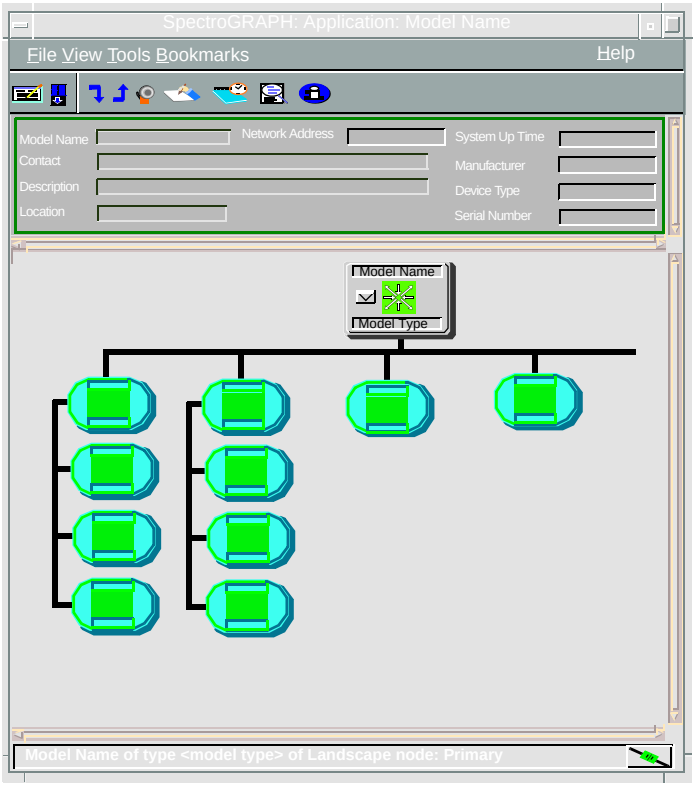
Access: *From the* ***Icon Subviews*** *menu for the Device icon, select* ***Application****.*

Main Application View

When a device model is created, SPECTRUM automatically creates models for each of the major and minor applications supported by the device. The main Application view identifies all of these application models, shows their current condition status, and provides access to application-specific subviews. Figure 14 shows this view in the Icon mode. If you prefer the List mode, which displays applications as text labels, select **View > Mode > List**.

For more information on this view, refer to the ***MIBs and the Application View*** document.

Figure 14: Main Application View



Common Applications

For the most part, these applications represent the non proprietary MIBs supported by your device. Listed below (beneath the title of the SPECTRUM document that describes them) are some of the common applications currently supported by SPECTRUM.

Note: The documents listed below (in bold font) are available for viewing at: www.aprisma.com/manuals/

- ***Routing Applications***
  - Generic Routing
  - Repeater
  - AppleTalk
  - DECnet
  - OSPF
  - OSPF2
  - BGP4
  - VRRP
  - RFC 2932
- ***Bridging Applications***
  - Ethernet Special Database
  - Spanning Tree
  - Static
  - Transparent
  - PPP Bridging
  - Source Routing
  - Translation
  - QBridge
- ***MIB II Applications***
  - SNMP
  - IP
  - ICMP
  - TCP
  - System2
  - UDP
- ***Transmission Applications***
  - FDDI
  - Point to Point
  - DS1
  - DS3
  - RS-232
  - WAN
  - Frame Relay
  - Token Ring
  - Ethernet
  - RFC 1317App
  - RFC 1285App
  - RFC 1315App
  - 802.11App
  - SONET

- ***Technology Applications***
  - APPN
  - ATM Client
  - DHCP
  - DLSw
  - PNNI
  - RFC 1316App
  - RFC 1514
  - RFC 2287
  - RFC 2790
  - RFC 2925
- ***DOCSIS Applications***
  - DOCSISCblDvApp
  - DOCSISQOSApp
  - DOCSISBPI2App
  - DOCSISBPIApp
  - DOCSISIFApp
- ***Digital Subscriber Line (DSL) Applications***
  - ADSL

Note: Aprisma Management Technologies can provide training, technical assistance, and custom engineering support services for creating application models and their associated views.

For information on the following optional applications, refer to the associated documentation.

Optional Applications

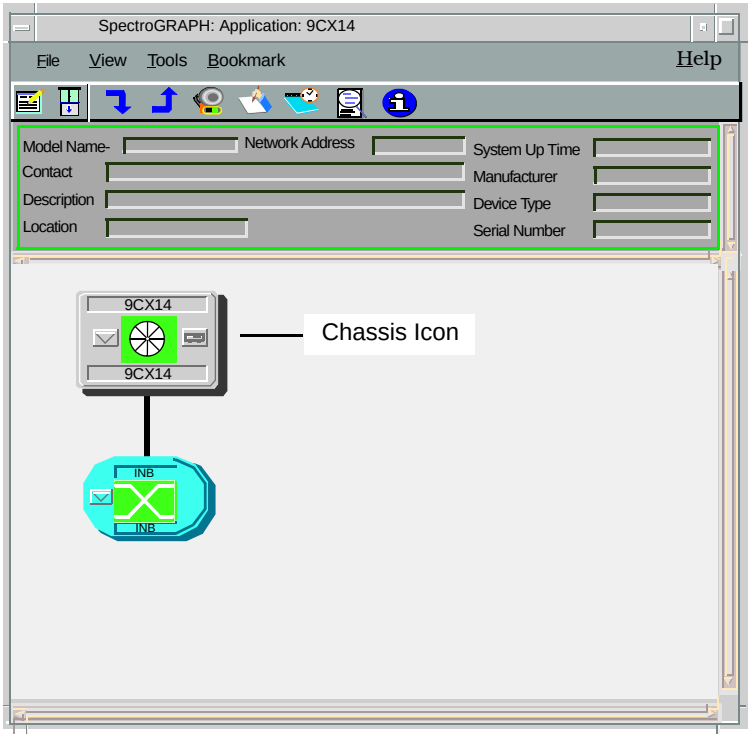
- Routing Services (CtRouter)
- DLM (DLM_Agent)
- Standard RMON (RMONApp)
- SecureFast VLAN (SFVLANApp)

Chassis Application View

Access: *From the **Icon Subviews** menu for the Device icon, select **Chassis Applications**.*

Contains information on the chassis in which the module is contained, and the INB icon.

Figure 15: Chassis Application View

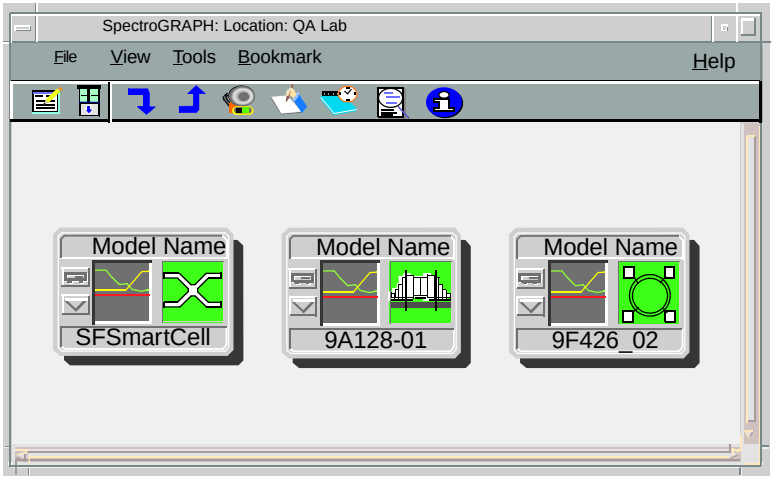


Container View

Access: *From the* ***Icon Subviews*** *for the Chassis Icon, select* ***Container****.*

Figure 16 displays Location view icons for each module installed in the SmartSwitch 9000 chassis. The views available from the Location view icons are described in this section.

Figure 16: Container View



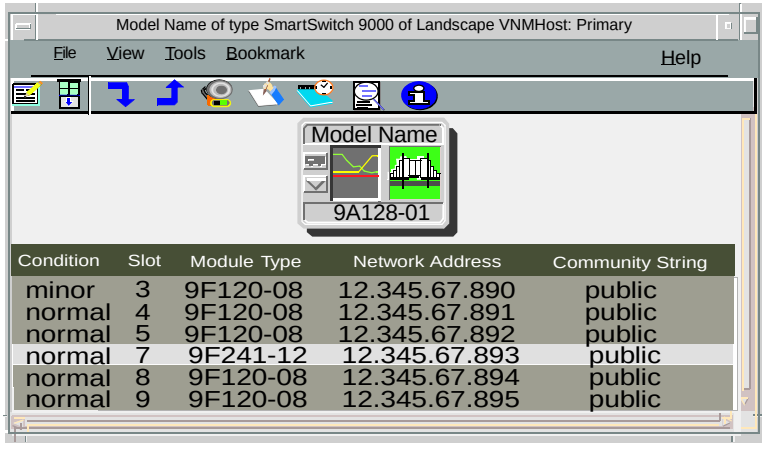
Module View

Access: *From the **Icon Subviews** for the Chassis icon, select **Module View**.*

Figure 17 displays Location view icons for each module installed in the chassis. Rows list the slot, model type, network address, and community string.

- To display the Location view icon for a specific model listed in the Module view, double-click on that row.
- To search the list in the Module view for a specific Module Type, select **Filter...** or **Search** from the **Tools** menu.
- To determine the number of modules installed in the chassis, select **Statistics** from the **Tools** menu.

Figure 17: Module View


Model Name of type SmartSwitch 9000 of Landscape VNMHost: Primary
File View Tools Bookmark Help
Model Name
9A128-01
Condition Slot Module Type Network Address Community String
minor 3 9F120-08 12.345.67.890 public
normal 4 9F120-08 12.345.67.891 public
normal 5 9F120-08 12.345.67.892 public
normal 7 9F241-12 12.345.67.893 public
normal 8 9F120-08 12.345.67.894 public
normal 9 9F120-08 12.345.67.895 public

Performance Views

This section provides brief descriptions of the Performance views available for the Cabletron devices in SPECTRUM.

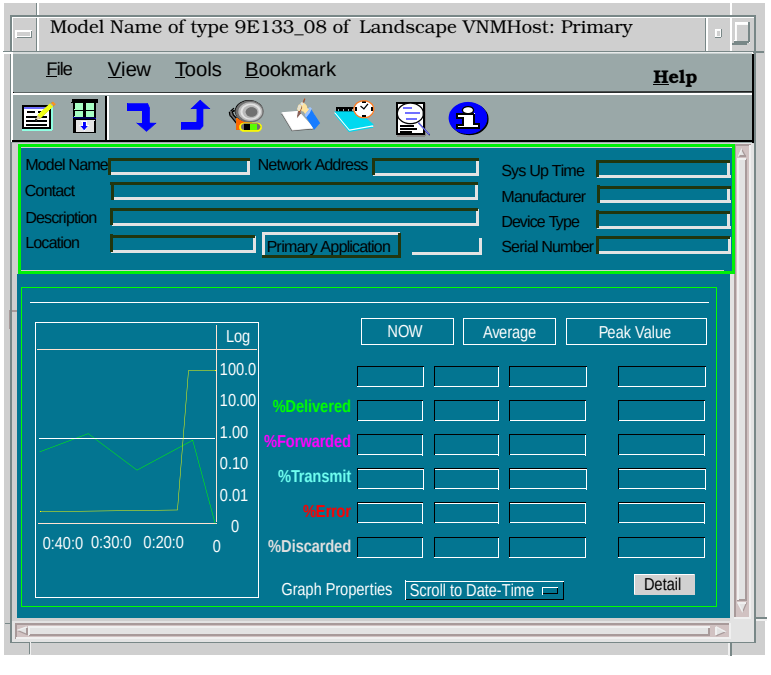
Performance views display performance statistics in terms of a set of transmission attributes, e.g., cell rates, frame rates, % error, etc. A typical view is shown in Figure 18. The instantaneous condition of each transmission attribute is recorded in a graph. The statistical information for each attribute is presented in the adjacent table.

For more information on Performance views, refer to the ***SPECTRUM Views*** documentation.

Note:

When modeling an SFSmartcell (9A6XX-XX) the model represents the entire switch (i.e. all 9A6XX-XX). Therefore, the Performance views statistics are calculated from the sum of all statistics on each of the 9A6XX-XX blades.

Figure 18: Performance View



Configuration Views

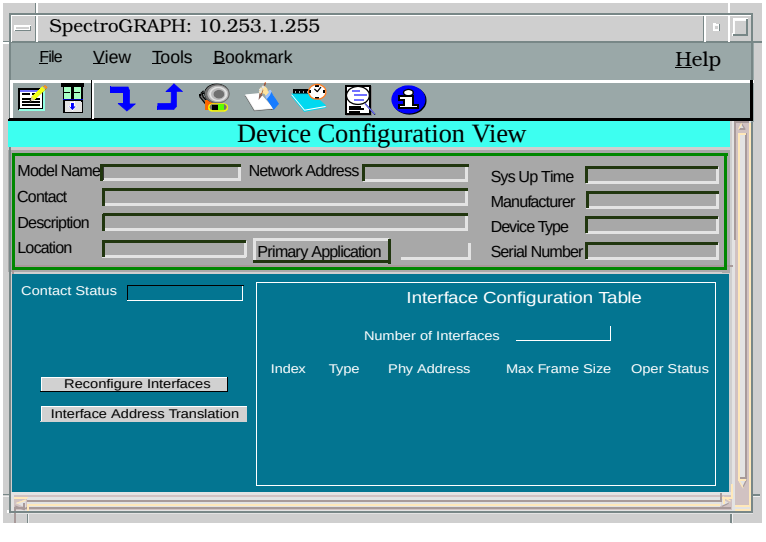
This section describes the various Configuration views available for models of the Cabletron devices in SPECTRUM.

Configuration Views

Figure 19 is an example of a Device Configuration View, which, along with the Port Configuration View also explained in this section, is common to most of the devices contained within the SmartSwitch 9000. Any configuration views that are device specific will be detailed in the appropriate technology section, listed below:

- *FDDI* (Page 51)
- *Token Ring* (Page 64)
- *ATM* (Page 88)
- *Ethernet* (Page 139)

Figure 19: Device Configuration View



Device Configuration View

Access: *From the **Icon Subviews** menu the SmartSwitch 6000 Device icon, select **Configuration**.*

This view (Figure 19 on Page 47) provides status and configuration information about the device as a whole as well as on a port-by-port basis. Fields and column headings within the Device Configuration view and its subviews are explained in further detail in the ***SPECTRUM Views*** documentation.

Contact Status

Indicates whether a connection has been established with the module.

Reconfigure Interfaces

This button updates the interfaces displayed in SPECTRUM to reflect any changes.

Interface Address Translation

Refer to the ***SPECTRUM Views*** documentation.

Port Configuration - CSIIf Port View

Access: *From the **Icon Subviews** menu for a specific interface label within a Chassis Module Icon, select **CSIIF Port.***

This view displays port-specific information for the device.

Interface Index
The numerical value identifying the port.

Interface Type
The type of interface for the port (FDDI).

Operation Status
The current operating state of the port. Possible values are: `On`, `Off`, and `Test`.

Admin Status
This field provides a button that allows you to change the current administrative state of the port. Possible values are: `On`, `Off`, and `Test`.

IF Description
Displays a description of the interface.

Model Information View

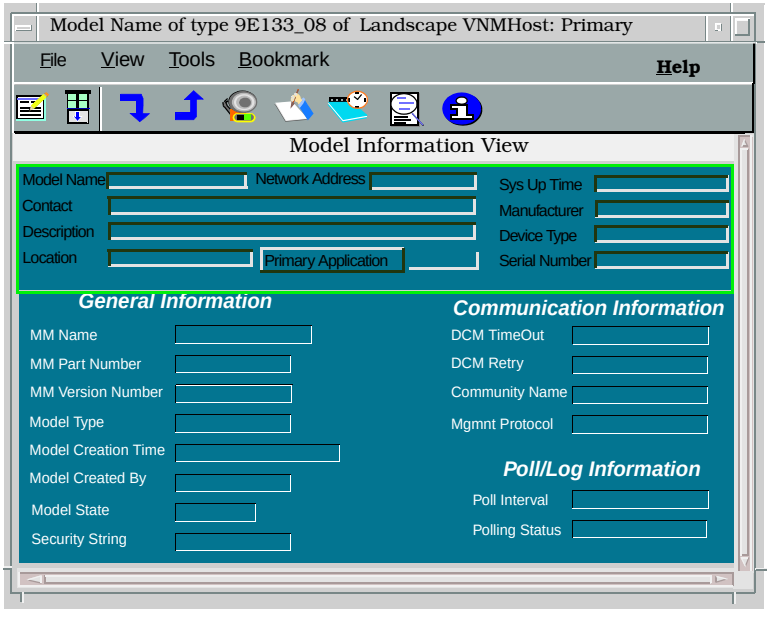
This section provides a brief overview of the Model Information view.

Model Information View

Access: *From the **Icon Subviews** for the Device icon, select **Model Information**.*

Figure 20 displays information about this device and allows you to set thresholds and alarm severity. This view may vary depending on the model it defines. For a more detailed description, refer to ***SPECTRUM Views***.

Figure 20: Model Information View



FDDI

This section provides a table of all the FDDI model types, the FDDI Chassis Icons associated with these model types, and general descriptions of the views that are available for the devices represented by these model types.

Overview

Below is a bulleted list of the main FDDI views for the SmartSwitch 9000, and a brief description of each. Table 10 represents all the FDDI Devices available for the SmartSwitch 9000. In addition, Figure 21 provides an example of FDDI Chassis module icons and the views which can be accessed from it. This figure includes links to examples of the Icon Subviews menus from which these same views can also be accessed.

- *FddiMAC Device Configuration View* (Page 56). Provides information on the configuration and operating status of the concentrator.
- *FDDI Port Configuration View* (Page 58). Provides information on the configuration and operating status of the ports.
- *Repeater Configuration View* (Page 60). Provides information on the configuration and operating status of the network the repeater is monitoring.
- *FDDI Station Table View* (Page 62). Displays the configuration of the FDDI ring.
- *FDDI Stats View* (Page 63). Displays the bandwidth statistics of the FDDI ring.

Table 10: FDDI Model Types

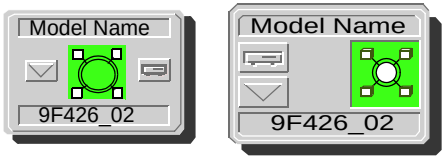
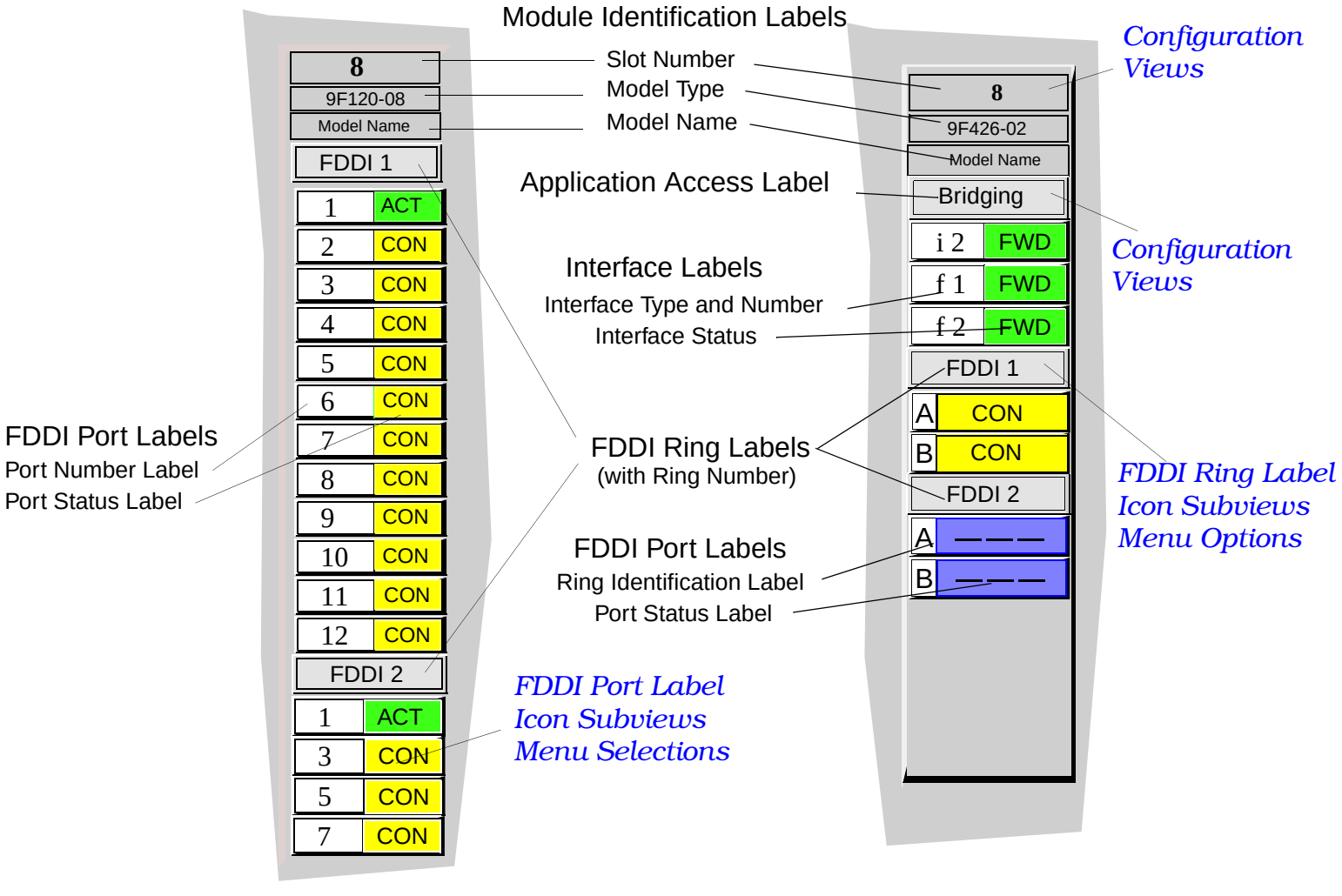
Device	Model Type	Example Device Icon
9F116-01 FDDI Switch Module	9F116-01	
9F120-08 MicroLAN Concentrator	9F120-08	
9F125-08 MicroLAN Concentrator	9F125-08	
9F122-12 MicroLAN Concentrator	9F122-12	
9F241-12 Concentrator Module-Dual Attached	9F241-12	
9F310-02 FDDI SmartSwitch Module	9F310-02	
9F426-02 FDDI SmartSwitch Module	9F426-02	
9F426-03 FDDI SmartSwitch Module	9F426-03	

Figure 21: FDDI Chassis Module Icon



FDDI Interface Label Icon Subviews Menu Options

Table 11 describes each of the device-specific Icon Subviews menu selections available for the Interface Label.

Table 11: Interface Label Icon Subviews Menu

Options	Opens the...
Configuration	Opens the *Port Configuration - CSIIf Port View* (Page 49).
Operational Mode Configuration	Opens the Port Configuration view for the selected port. Allows you to either select Standard Mode of Full Duplexing.

Repeater Labels

These labels display information pertaining to the repeater ports as follows:

Port Number Label

The number for the port.

Port Status Label

The current operating status of this port. Table 12 lists the possible conditions values and associated colors.

Table 12: Repeater Port Status and Conditions Values and Colors

Color	Status	Description
Green	ON	Port is operational.
Blue	OFF	Port is off.
Yellow	TST	Port is in the test mode.

Frame Rate Label

The frame traffic rate over this port.

FDDI Ring Label

This label (see Figure 21) represents the front panel FDDI connection and provides double-click access to the Ring Performance view.

FDDI Ring Label Icon Subviews Menu Options

Table 13 describes each of the device-specific Icon Subviews menu selections available for the FDDI Ring Label.

Table 13: FDDI Icon Subviews Menu

Options	Opens the...
FDDI Performance	*Performance Views* (Page 46). (Not available for FddiNoMAC.)
FDDI Configuration	*FddiMAC Device Configuration View* on Page 56.
FDDI Station List	*FDDI Station Table View* on Page 62. (Not available for FddiNoMAC.)
FDDI Bandwidth Util.	*FDDI Stats View* on Page 63.
FDDI Model Information	*Model Information View* on Page 50.

FDDI Port Labels

These labels (see Figure 21) display information pertaining to the network interface module ports. These areas are as follows:

Port Number Label

The port on the ring.

Ring Identification Label

The ring this port is connected to (A or B).

Port Status Label

The status of this port. Table 14 lists the possible states and corresponding colors.

Table 14: FDDI Port Status and Descriptions

Color	State	Description
Green	ACT	Port is active and connected to the FNB.
Blue	DIS	Port is disabled.
Yellow	CON	Port is in the connecting state.
Blue	- - -	A potential connection to the FNB exists but is not made at this time.

FDDI Port Label Icon Subviews Menu Selections

Table 15 describes each of the device-specific Icon Subviews menu selections available for the FDDI Port Label.

Table 15: FDDI Port Icon Subviews Menu

Options	Opens the...
Enable/Disable Port	Allows you to Enable or Disable the port.
Port Configuration	*FDDI Port Configuration View* (Page 58).

FddiMAC Device Configuration View

Access: *Highlight the FDDI Ring Labels in the Chassis Device views and from the* ***Icon Subviews*** *menu, select* ***FDDI Configuration****.*

This view provides information on the configuration and operating status of the Station Configuration.

Station Configuration

This area of the FddiMAC Device Configuration view provides information specific to the FDDI station:

Ring State

The current state of the FDDI Ring. Table 16 lists the possible states and their descriptions.

Table 16: FDDI Ring States

Ring States	Description
Isolated	The concentrator is not attached to the ring.
Non-Op	The concentrator is attempting to enter the ring.
Ring-Op	The ring is operational.
Detect	The claim/beacon process of the FDDI ring protocol has exceeded 1 second. This indicates a potential problem.
Non-Op-Dup	The ring failed to complete the claim/beacon process because a duplicate FDDI address has been detected.
Ring-Op-Dup	The ring is operational, but a duplicate FDDI address has been detected.

Table 16: FDDI Ring States (Continued)

Directed	The claim/beacon process did not complete within 9 seconds. The concentrator is now sending directed beacons to indicate a problem.
Trace	A problem has been detected with the station or its upstream neighbor. A trace is being sent to notify the upstream neighbor of the problem. The concentrator and all stations between the concentrator and its upstream neighbor can perform self-tests.

MAC Configuration

The actual configuration of the station. Table 17 lists the possible configurations and their descriptions.

Table 17: SMT MAC Configurations

Ring States	Description
Isolated	The path is not inserted into any path.
Local_A	The A port is inserted into a local path and the B port is not.
Local_B	The B port is inserted into a local path and the A port is not.
Local_AB	Both A and B are inserted into a local path.
Local_S	The S port is inserted into a local path.
Wrap_A	The secondary path is wrapped to the A port.

Table 17: SMT MAC Configurations

Wrap_B	The secondary path is wrapped to the B port.
Wrap_AB	The primary path is wrapped to the B port and the secondary path is wrapped to the A port.
Wrap_S	The primary port is wrapped to the S port.
C_Wrap_A	The primary and secondary paths are joined internally in the station and wrapped to the A port. Regarding token flow, all resources on the secondary path precede those of the primary path.
C_Wrap_B	The primary and secondary paths are joined internally in the station and wrapped to the B port. Regarding token flow, all resources on the secondary path precede those of the primary path.
C_Wrap_S	The primary and secondary paths are joined internally in the station and wrapped to the S port. Regarding token flow, all resources on the secondary path precede those of the primary path.
Thru	The primary path enters the A port and emerges from the B port. The secondary path enters the B port and emerges from the A port.

Current MAC Path
The ring that this station resides on. Possible entries are: `Primary`, `Secondary`, `Local`, or `Isolated`.

MAC Address
The MAC (physical) address of this station.

MAC Count
The number of MACs supported by this station.

Non Master Ports
The number of non-master ports on this station.

Master Ports
The number of master ports on this station.

SMT Information

This section of the FddiMAC Device Configuration view provides the following configuration information on the FDDI SMT:

SMT Version
The version of Station Management (SMT) running.

OBS Present
Indicates whether an Optical Bypass Switch (OBS) is connected.

T-Notify (sec)
The timer value, in seconds, used in Neighbor Notification Protocol. The allowed range is from 2 to 30 seconds.

T-Req (milli sec)
The Target Token Rotation Time (TTRT) bid, in milliseconds, made by this concentrator.

T-Neg (milli sec)
The winning TTRT bid, in milliseconds, on the ring.

TVX (milli sec)
The valid transmission time, in milliseconds.

FDDI Port Configuration View

Access: *Highlight the FDDI Port Labels in the Chassis Device views and from the* ***Icon Subviews*** *menu, select* ***Port Configuration View****.*

This view provides information on the configuration and operating status of the ports.

Port Management

This section of the FDDI Port Configuration view provides the following information:

Port Action
This field provides a button that allows you to `enable/disable` the port. The state returns to

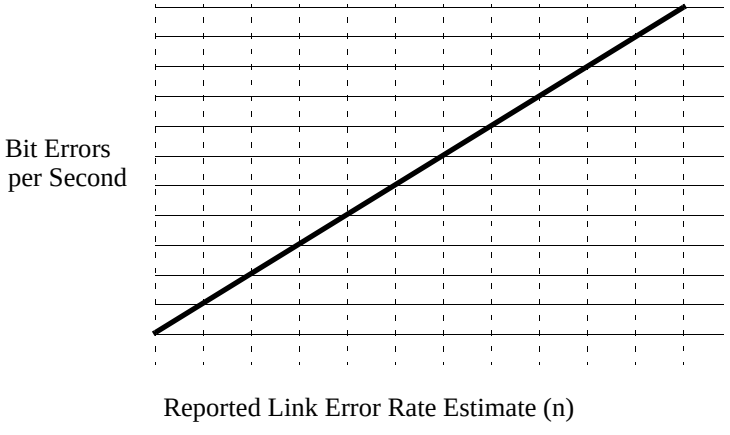
"Other" once the port has been `Enabled/Disabled`.

Port State
The status of this port. Possible states are: `disabled`, `connecting`, `standby`, and `active`.

Port Type
The type of port. Possible port types are: `A_Port`, `B_Port`, `Slave`, or `Master`.

Link Error Rate Estimate
The link error rate estimate is a cumulative long-term average of the bit error rate, which represents the quality of the physical link. The link error rate estimate is computed when the port is connected and every 10 seconds thereafter. It ranges from 10^{-4} to 10^{-15} and is reported as a whole integer. For example, if the port's link error rate estimate is computed to be 10^{-5}, the value reported in this field would be 5, which represents an actual rate of 1,250 bit errors per second. A lower link error rate estimate indicates a higher bit error rate as shown in Figure 22.

Figure 22: Link Estimate Table



Link Error Monitor Count
The aggregate link error monitor count. This count is set to zero on station power up and increments each time the port's link error monitor detects an error. An increasing link error monitor count usually indicates a problem with the connectors or the cable between this port and the node.

Link Error Rate Cutoff
The link error rate threshold at which a link connection is flagged as faulty and the port disabled by SMT. The default link error rate cutoff threshold is 7, which represents 12.5 bit errors per second.

Link Error Rate Alarm
The link error rate threshold that, if exceeded, generates an alarm for the port. The default link error rate alarm threshold is 8, which represents 1.25 bit errors per second.

Link Error Monitor Reject Count
The link error monitor count of the times the link has been rejected.

Repeater Configuration View

Access: *Within the Application views, highlight the CsEnetRptr Icon, and from the* ***Icon Subviews*** *menu, select* ***Configuration*** *or from within the Chassis Device views, highlight the Repeater Labels and from the* ***Icon Subviews*** *menu, select* ***Repeater Configuration****.*

This view provides information on the configuration and operating status of the network the repeater is monitoring.

Repeater Management

This area of the Repeater Configuration view provides the following port information:

Port Count
The total number of ports on this LAN segment.

Ports On
The total number of ports currently in the ON state on this network.

Ports Operational
The number of operational ports on this network.

Network Ports
Allows you to select the desired operational state of network ports on this network segment. Valid values are: `Enable` or `NoEnable`.

Network Port Security
Allows you to select the security status of repeater ports. Valid values are: `UnLocked` or `Locked`.

Source Address Management

This area of the Repeater Configuration view indicates the timeout period, in seconds.

Ageing Interval
The time, in seconds, that dynamically learned forwarding information remains in the database before being selected.

Trap Configuration

This area of the Repeater Configuration view allows you to enable or disable any of the following types of traps.

Link Traps
When enabled, all packets indicating a change in link status are reported within the trap database. Valid values are: `NoEnable`, `Enable`, or `other`.

Segmentation Traps
When enabled, all packets indicating a change in segmentation status are reported within the trap database. Valid values are: `NoEnable`, `Enable`, or `other`.

Source Address Traps
When enabled, all packets indicating a change in source address are reported within the trap database. Valid values are: `NoEnable`, `Enable`, or `other`.

Alarm Configuration

This area of the Repeater Configuration view provides configuration information on generating alarms for the selected module. The configuration information is as follows:

Timebase
This field allows you to set the alarm timebase. The timebase is the number of seconds used as the interval for performing all of the rate alarm checks. The minimum is 10 seconds. For example, if the timebase is 10 seconds, an alarm will occur only when the specified number of errors occurs within 10 seconds.

Traffic Alarms
Allows you to turn traffic alarms off and on. Valid values are: `NoEnable` or `Enable`.

Traffic Threshold
The threshold value within the alarm timebase that, once the number of packets is exceeded, generates a traffic alarm.

Collision Alarms
Allows you to turn collision alarms off and on. Valid values are: `NoEnable` or `Enable`.

Collision Threshold
The threshold value within the alarm timebase that, once the number of collisions per good packet is exceeded, generates a collision alarm.

Broadcast Alarms
Allows you to turn broadcast alarms off and on. Valid values are: `NoEnable` or `Enable`.

Broadcast Threshold
The threshold value within the alarm timebase that, once the number of broadcasts received is exceeded, generates a broadcast alarm.

Error Alarms
Allows you to turn error alarms off and on. Valid values are: `NoEnable` or `Enable`.

Error Threshold
The threshold value within the alarm timebase that, once the percentage of errors per good packet is exceeded, generates an error alarm.

Error Source
This area of the Repeater Configuration view provides a series of buttons allowing you to select the types of errors to include in the error sum. The selectable error types are as follows:

CRC
The number of packets received by the module with bad Cyclical Redundancy Checks (CRCs).

Runts
The number of runt packets received by the module. A runt packet is one byte less than the standard Ethernet frame of 64 bytes (not including preamble).

OOW_Colls
The number of collisions out of the standard window (51.2µs) due to a network problem.

Alignment
The number of misaligned packets detected by the module.

No_Resource
The number of times the module ran out of resources (i.e., lack of buffer space) and could not accept packets.

Giants
The number of giant packets received by the module. A giant packet exceeds 1518 bytes (not including preamble).

FDDI Station Table View

Access: *From the **Icon Subviews** menu for the FddiMAC Application icon, select **Fddi Station List**.*

This view displays the configuration of the FDDI ring, basic information about the devices in the ring, and FDDI network.

Update, Print, Sort and Find

Use these buttons to perform the functions listed in the contents of the Station Table.

MAC/Canonical

This button affects the display of the station addressed, toggling between `MAC` (Physical) and `Canonical` (Ethernet). This button displays the format **NOT** currently selected.

Station Address
The MAC or Canonical address of this node on the ring.

Node Class
The type of FDDI ring device. Table 18 describes possible node classes.

Table 18: FDDI Node Classes

Node Class	Description
Station	An FDDI node capable of receiving, transmitting, and repeating data.
Concentrator	An FDDI node that provides attachment points for stations that are not directly connected to the FDDI ring.

Ring Topology
The current state of this FDDI node.

Master Ports
The number of master ports on this node. Values range from 0 to 255.

Upstream Neighbor
The canonical or MAC address of the last node to receive the token before this node.

FDDI Stats View

Access: *From the **Icon Subviews** menu for the FddiMAC Application Icon, select **Bandwidth Util**.*

The FDDI Stats view displays the bandwidth statistics of the FDDI ring and basic information about the devices on the ring and FDDI network.

Fddi Frames (Frm/Sec)
The number of FDDI frames per second for the device.

Fddi KBytes (Kb/Sec)
The number of FDDI KBytes per second for the device.

Fddi Peak KBytes (Kb/Sec)
The number of FDDI peak KBytes per second for the device.

Time of Peak
The time of peak in **Day:Month:Time:Year** format for the device.

Bandwidth Utilization%
The amount (in percent) of bandwidth utilized by the device. The chart provides a graphical representation of the bandwidth being utilized in bytes/second on the FDDI ring.

Token Ring

This section provides a table of all the Token RIng model types, the Token Ring Chassis icons associated with these model types and general descriptions of the views that are available for the devices represented by these model types.

Overview

Below is a bulleted list of the main Token Ring views for the SmartSwitch 9000, and a brief description of each. Table 19 displays all the Token Ring Devices available for the SmartSwitch 9000. In addition, Figure 23 provides an example of a Token Ring Chassis module icon and the views which can be accessed from it. This figure includes links to examples of the Icon Subview menus from which these same views can also be accessed.

- *Token Ring Configuration View* (Page 69). Displays information on the configuration of the Token Ring application.
- *TR Ring Configuration View* (Page 70). Displays configuration information on the ring to which the ports are attached.
- *Token Ring Security Configuration View* (Page 72). Provides information on the security configuration for the ring.
- *Token Ring Station Table View* (Page 73). Displays a Station Table containing information for all stations directly connected to the ring.
- *Token Ring Station Isolating Errors View* (Page 75). Displays an Isolating Errors Table containing information for all stations directly connected to the ring.

Table 19: Token Ring Model Types

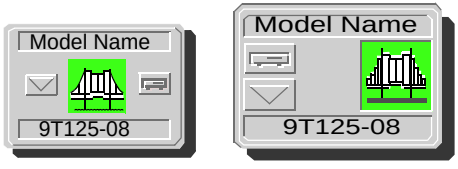
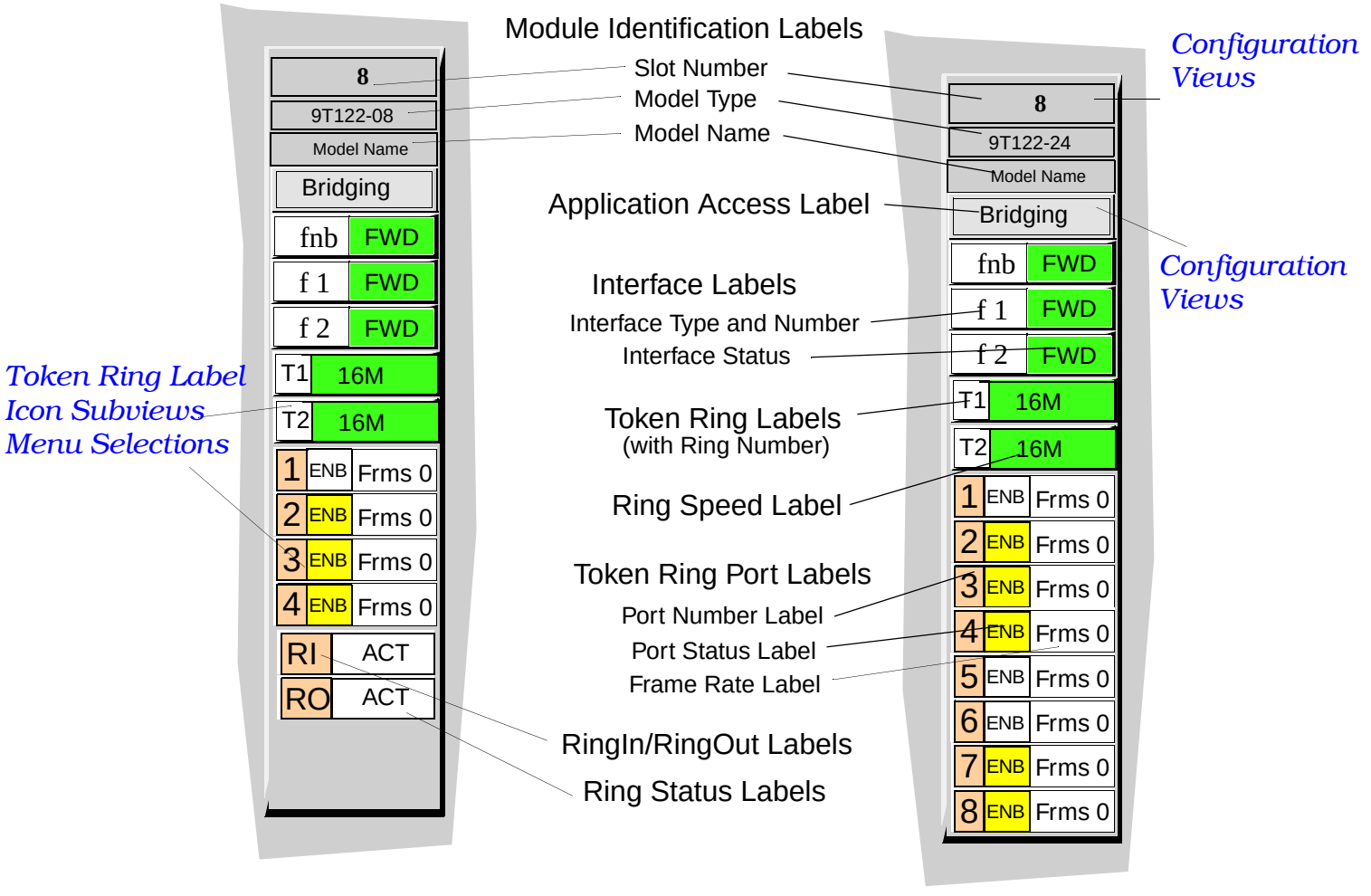
Device	Device Type	Example Device Icon
9T122-08 MicroLAN Switch Extension Module	9T122-08	
9T122-24 MicroLAN Switch Module	9T122-24	
9T125-08 MicroLAN Switch Module	9T125-08	
9T125-24 MicroLAN Switch Extension Module	9T125-24	
9T425-16 Token Ring SmartSwitch Module (dual slot)	9T425-16	
9T427-16 Token Ring SmartSwitch Module (single slot)	9T427-16	
9T428-16 Token Ring SmartSwitch Module (dual slot)	9T428-16	

Figure 23: Example Token Ring Chassis Module Icon



Token Ring Label

Figure 23 represents the Token Ring connection and displays the ring number it represents. Double-click this label to access the *Token Ring Configuration View* (Page 69).

Token Ring Label Icon Subviews Menu Selections

Table 20 describes each of the device-specific Icon Subviews menu selections available for the Token Ring Label.

Table 20: Token Ring Icon Subviews Menu

Options	Open the...
Configuration	*Token Ring Configuration View* (Page 69).
Model Information	*Model Information View* (Page 50).
Stations	*Token Ring Station Table View* (Page 73).
Station Errors	*Token Ring Station Isolating Errors View* (Page 75).
Speed Fault	*Token Ring Station Detail View* (Page 80).
Change Ring Speed	Allows you to set the ring speed to 4M or 16M.

Ring Speed Label

The speed this ring is configured to operate at (4M or 16M). Double-click on this area to open the Change Ring Speed view for the selected ring. This view allows you to set the desired ring speed.

Token Ring Port Labels

These labels display information pertaining to the network interface module ports as follows:

Port Number Label

The port on the ring.

Port Status Label

The status of this port. Table 21 lists the possible conditions values and associated colors.

Table 21: Port Status Conditions and Colors

Condition	Color
INIT (Initial)	Gray
ENB (Enabled)	Yellow
BYP (Bypassed)	Blue
DIS (Disabled)	Blue
INS (Inserted)	Green
ACT (Active)	Green
WRP (Wrapped)	Red

Frame Rate Label

The frame traffic rate over this port. Double-click on this area to open the *Token Ring Station Detail View* (Page 80).

Ring In/Ring Out and Ring Status Labels

These labels displays the operational status of the Ring In and the Ring Out.

Token Ring Port Icon Subviews Menu Options

Table 22 describes the Icon Subviews menu selections available for Token Ring ports.

Table 22: Token Ring Port Icon Subviews Menu Selections

Options	Opens the...
Port Notes	Port Notes view, which allows you to attach notes to port view.
Port Configuration	*Token Ring Configuration View* (Page 69).
Station Detail	*Token Ring Station Detail View* (Page 80).
Enable/Disable Port	The Enable/Disable Port view, allowing you to toggle the state of the port.

Token Ring Configuration View

Access: *Within the Application view, highlight the CsTRApp and from the* ***Icon Subviews*** *menu, select* ***Configuration****,*

This view provides information on the configuration of the Token Ring application.

Ring Name
The ASCII name assigned to this ring. This name defaults to *Network n*, where *n* is a unique integer value.

Ring Number
The number of the attached ring. If SPECTRUM cannot determine the number of the ring, a zero is returned.

Ring Speed
The speed of the ring, which has a value of 4 or 16 `megabits`.

Ring Status
The operational state of the ring.

Ring Configuration

Opens the *TR Ring Configuration View* (Page 70).

Ring Security

Opens the *Token Ring Security Configuration View* (Page 72).

Alarms Table

Opens the *Token Ring Station Alarm Thresholds View* (Page 79).

Port Configuration

This section of the Token Ring Configuration view provides the following information:

Station Ports ON Out Of
The total number of enabled station ports on the addressed module.

Enable All Station Ports
Allows you to enable all the station ports in this port group by setting the value to **Enable**. The default value is `NoEnable`.

Ring Ports ON Out Of
The total number of enabled ring in/ring out ports in this port group.

Enable All Ring Ports
Allows you to enable all the ring ports in this port group by setting the value to **Enable**. The default value is `NoEnable`.

Host Configuration

This section of the Token Ring Configuration view provides the following information:

Commands

Allows you to send commands to the device. Possible commands are: `HardwareReset`, `SoftwareReset`, `Open`, and `Close`. The default value is `NoOperation`.

Error Report Timer

The time interval in which the host adapter reports errors to the ring error monitor.

Open Status

The status of the device, or errors it has received, with respect to insertion into the ring.

Active Monitor Contention

Allows you to prohibit the possibility of the device becoming the active monitor for the ring by setting the proper **`Allowed`** or **`NotAllowed`** status.

Host Error Status

This box in the Host Configuration section of the Token Ring Configuration view provides a series of read-only indicator buttons detailing the last error status returned by the Device.

TR Ring Configuration View

Access: *In the Token Ring Configuration view, click the* ***Ring Configuration*** *button.*

This view provides configuration information on the ring to which the ports are attached.

Ring Configuration

This section of the TR Ring Configuration view displays the following information:

Ring Name

The ASCII name assigned to this ring. This name defaults to *Network n*, where *n* is a unique integer value.

Ring Number

The number of the attached ring. If SPECTRUM cannot determine the number of the ring, a zero is returned.

Ring Speed

The speed of the ring, which can have a value of `4` or `16 megabits`.

Ring Status

The operational state of the ring.

Active Monitor

The MAC address of the active monitor for the ring. This address will appear in any tables with an asterisk (*) to identify it.

Active Stations
The number of active stations currently inserted on the ring.

Beacon Recovery
Provides a button, allowing you to **Enable** or **Disable** automatic beacon recovery for the TR MicroLAN Switch Module. When Disabled, the TR MicroLAN Switch Module will not attempt to reinsert itself into the ring after entering a beaconing state. If the device does not support automatic beacon recovery, SPECTRUM will display a status of "**Invalid**".

Ring Alarm/Threshold/State

This section of the TR Ring Configuration view has three columns, displaying information on the ring alarms, their current thresholds, and their states (Enabled or Disabled).

Ring Purges
Allows you to set a value for the Ring Purges alarm threshold, and the state button allows you to **Enable** or **Disable** detection of this alarm.

AMP Errors
Allows you to set a value for the Active Monitor Error alarm threshold, and the state button allows you to **Enable** or **Disable** detection of this alarm.

Claim Token Errors
Allows you to set a value for the Claim Token Errors alarm threshold, and the state button allows you to **Enable** or **Disable** detection of this alarm.

Lost Frames
The threshold field allows you to set a value for the Lost Frames alarm threshold, and the state button allows you to **Enable** or **Disable** detection of this alarm.

Token Errors
Allows you to set a value for the Token Errors alarm threshold, and the state button allows you to **Enable** or **Disable** detection of this alarm.

Beacon State
Allows you to set a value for the Beacon State alarm threshold, and the state button allows you to **Enable** or **Disable** detection of this alarm.

Frame Count
Allows you to set a value for the Frame Count alarm threshold, and the state button allows you to **Enable** or **Disable** detection of this alarm.

Ring Timebase
Allows you to set the timebase used for getting and setting all alarms pertaining to this ring. This value is measured in seconds.

Token Ring Security Configuration View

Access: *From the Token Ring Configuration views, click the* ***Ring Security button****.*

This view provides information on the security configuration for the ring.

Ring Name
The ASCII name assigned to this ring. This name defaults to *Network n*, where *n* is a unique integer value.

Ring Number
The number of the attached ring. If SPECTRUM cannot determine the number of the ring, a zero is returned.

Ring Status
The operational state of the ring.

Ring Speed
The speed of the ring, which can have a value of `4` or `16 megabits`.

Administration State
Table 23 displays the valid administration states.

Table 23: Administration States

State	Description
EnabledWithAlarm	Generates an alarm upon insertion of an illegal station into the ring.
EnabledWithRemoveAndAlarm	Generates an alarm and also removes the illegal station from the ring.
Disabled	Turns off security.

Total Allowed Stations
The total number of stations in the **Allowed Stations** list.

Allowed Station Address Table

This section of the Token Ring Security Configuration View contains a list of addresses and interface numbers for the stations allowed on the ring. The active monitor for the ring is indicated by an asterisk (*) beside the address. Double-clicking a table entry opens the *Modify Allowed Station List View* (Page 85). This table has the following buttons.

Update

Allows you to update the contents of the Station Address Table.

MAC/Canonical

Affects the display of the station addresses, toggling the format between `MAC` (Physical) and `Canonical`. The button displays the format not currently selected.

Set/Clear Filter

Allows you to set a filter affecting the stations displayed in the table. You select an attribute to filter against by clicking one of the column heading buttons.

Sort Up/Sort Down/Un-Sort

Allows you to sort the stations displayed in the table. You select an attribute to sort on by clicking one of the column heading buttons.

Modify Allowed Station List

Opens the *Modify Allowed Station List View* (Page 85).

Token Ring Station Table View

Access: *From the **Icon Subviews** menu of the CsTRApp, select **Stations**.*

This view displays a Station Table containing information for all stations directly connected to the ring. It also displays buttons which manipulate the information in the table, and buttons to access other views.

Ring Name
The ASCII name assigned to this ring. This name defaults to *Network n*, where *n* is a unique integer value.

Ring Number
The number of the attached ring. If SPECTRUM cannot determine the number of the ring, a zero is returned.

Ring Speed
The speed of the ring, which can have a value of `4` or `16 megabits`.

Ring Status
The operational state of the ring.

Active Monitor
The MAC address of the active monitor for the ring. This address will appear in any tables with an asterisk (*) to identify it.

Station Address
The MAC address of the station to which this information pertains.

Station Name
The ASCII name assigned to this station.

Frames
The total number of frames that have been received/generated by this station.

Errors
The total number of errors that this station has detected on the ring.

Port
The number of the port on the token ring module to which this station is connected.

Update

Updates the contents of the Station Table.

Totals/Deltas

Affects the display of statistical information. Selecting **Totals** displays the statistics as totals since the TR MicroLAN Switch Module was initialized. Selecting **Deltas** displays the difference between the current value and the value at the time of the last update. The button displays the format currently selected.

MAC/Canonical

This button affects the display of the station addressed, toggling between `MAC` (Physical) and `Canonical` (Token Ring). This button displays the format **NOT** currently selected.

Set Filter/Clear Filter

Set Filter Opens the Filter Dialog box for the selected column of the Station table. Type a character string to search the column. Clear Filter returns the Station table to its normal state.

Sort Up/Sort Down/Unsort

Sort Up organizes the list within a selected column from the lowest alphanumeric value to the highest. Sort Down organizes the list within a selected column from the highest alphanumeric value to the lowest. Unsort returns the fields to its normal state.

Isolating Errors Table

Opens the *Token Ring Station Isolating Errors View* (Page 75).

Alarms Table

Opens the *Token Ring Station Alarm Thresholds View* (Page 79).

Station Detail

Opens the *Token Ring Station Detail View* (Page 80).

Station Alarms

Opens the *Station Alarms Dialog Box* (Page 82).

Remove Station

Allows you to remove the selected station from the ring.

Token Ring Station Isolating Errors View

Access: *Click the **Isolating Errors Table** button in the Token Ring Station Table view.*

This view displays an Isolating Errors Table containing information for all stations directly connected to the ring.

This view provides the following information:

Ring Name
The ASCII name assigned to this ring. This name defaults to *Network n*, where *n* is a unique integer value.

Ring Number
The number of the attached ring. If SPECTRUM cannot determine the number of the ring, a zero is returned.

Ring Speed
The speed of the ring, which can have a value of `4` or `16 megabits`.

Ring Status
The operational state of the ring.

Active Monitor
The MAC address of the active monitor for the ring. This address appears in all tables with an asterisk (*) to identify it.

Station Address
The MAC address of the station to which this information pertains.

Station Name
The ASCII name assigned to this station.

Line
The number of line errors that this station has detected on the ring.

Burst
The number of burst errors that this station has detected on the ring.

A/C
The number of address/copied errors that this station has detected on the ring.

Abort
The number of abort sequences that this station has sent.

Internal
The number of internal errors that this station has detected.

Update

Updates the contents of the Token Ring Station Isolating Errors Table.

Totals/Deltas

Affects the display of statistical information. Selecting **Totals** displays the statistics as totals since the TR MicroLAN Switch Module was initialized. Selecting **Deltas** displays the difference between the current value and the value at the time of the last update. The button displays the format currently selected.

MAC/Canonical

This button affects the display of the station addressed, toggling between `MAC` (Physical) and `Canonical` (Token Ring). This button displays the format **NOT** currently selected.

Set Filter/Clear Filter

Set Filter opens the Filter Dialog box for the selected column of the Station table. Type a character string to search the column.

Clear Filter returns the Station table to its normal state.

Sort Up/Sort Down/Unsort

Sort Up organizes the list within a selected column from the lowest alphanumeric value to the highest.

Sort Down organizes the list within a selected column from the highest alphanumeric value to the lowest.

Unsort returns the fields to its normal state.

Non-Isolating Errors

Opens the *Token Ring Station Non-Isolating Errors View*.

Alarms Table

Opens the *Token Ring Station Alarm Thresholds View* (Page 79).

Station Detail

Opens the *Token Ring Station Detail View* (Page 80).

Station Alarms

Opens the *Station Alarms Dialog Box* (Page 82).

Remove Station

Removes the selected station from the ring.

Token Ring Station Non-Isolating Errors View

Access: *From the Token Ring Station Isolating Errors view, click* ***Non-Isolating Errors Table*** *button.*

This view displays information for all stations directly connected to the ring.

Ring Name
The ASCII name assigned to this ring. This name defaults to *Network n*, where *n* is a unique integer value.

Ring Number
The number of the attached ring. If SPECTRUM cannot determine the number of the ring, a zero is returned.

Ring Speed
The speed of the ring, which can have a value of 4 or `16 megabits`.

Ring Status
The operational state of the ring.

Active Monitor
The MAC address of the active monitor for the ring. This address will appear in any table with an asterisk (*) to identify it.

Station Address
The MAC address of the station to which this information pertains.

Station Name
The ASCII name assigned to this station.

Lost Frames
The number of lost frames that this station has detected on the ring.

Congestions
The number of congestion errors that have occurred at this station.

FrameCopied
The number of frame copied errors that this station has detected on the ring.

Token
The number of token errors that this station has detected on the ring while it was acting as the active monitor.

Frequency
The number of frequency errors that this station has detected on the ring.

Update

Updates the contents of the Token Ring Station Non-Isolating Errors Table.

Totals/Deltas

Affects the display of statistical information. Selecting **Totals** displays the statistics as totals since the TR MicroLAN Switch Module was initialized. Selecting **Deltas** displays the difference between the current value and the value at the time of the last update. The button displays the format currently selected.

MAC/Canonical

This button affects the display of the station addressed, toggling between `MAC` (Physical) and `Canonical` (Token Ring). This button displays the format **NOT** currently selected.

Set Filter/Clear Filter

Set Filter opens the Filter Dialog box for the selected column of the Station table. Type a character string to search the column

Clear Filter returns the Station table to its normal state.

Sort Up/Sort Down/Unsort

Sort Up organizes the list within a selected column from the lowest alphanumeric value to the highest.

Sort Down organizes the list within a selected column from the highest alphanumeric value to the lowest.

Unsort returns the fields to its normal state.

Alarms Table

Opens the *Token Ring Station Alarm Thresholds View* (Page 79).

Station Detail

Opens the *Token Ring Station Detail View* (Page 80).

Station Alarms

Opens the *Station Alarms Dialog Box* (Page 82).

Remove Station

Removes the selected station from the ring.

Token Ring Station Alarm Thresholds View

Access: *From the Token Ring Station Non-Isolating Errors view, click the* ***Alarm Table*** *button.*

This view displays information for all stations directly connected to the Token Ring.

Ring Name
The ASCII name assigned to this ring. This name defaults to *Network n*, where *n* is a unique integer value.

Ring Number
The number of the attached ring. If SPECTRUM cannot determine the number of the ring, a zero is returned.

Ring Speed
The speed of the ring, which can have a value of `4` or `16 megabits`.

Ring Status
The operational state of the ring.

Active Monitor
The MAC address of the active monitor for the ring. This address will appear in any tables with an asterisk (*) to identify it.

Station Address
The MAC address of the station to which this information pertains.

Station Name
The ASCII name assigned to this station.

Line
The threshold setting for line errors on the device.

Burst
The threshold setting for burst errors on the device.

A/C
The setting for address/copied errors on the device.

Internal
The threshold setting for internal errors on the device.

Congestions
The threshold setting for congestion errors.

Update

Updates the Station Alarm Thresholds Table.

MAC/Canonical

This button affects the display of the station addressed, toggling between `MAC` (Physical) and `Canonical` (Token Ring). This button displays the format **NOT** currently selected.

Set Filter/Clear Filter

Set Filter opens the Filter Dialog box for the selected column of the Station table. Type a character string to search the column.

Clear Filter returns the Station table to its normal state.

Sort Up/Sort Down/UnSort

Sort Up organizes the list within a selected column from the lowest alphanumeric value to the highest.

Sort Down organizes the list within a selected column from the highest alphanumeric value to the lowest.

Unsort returns the field to its normal state.

Alarm States Table

Opens the Token Ring Station Alarm States View, which provides the same button functions and fields as the *Token Ring Station Alarm Thresholds View* (Page 79), but displays information on the state of each alarm threshold (Enabled or Disabled).

Station Detail

Opens the *Token Ring Station Detail View*.

Station Alarms

Opens the *Station Alarms Dialog Box* (Page 82).

Remove Station

Allows you to remove the selected station from the ring.

Token Ring Station Detail View

Access: *From the Token Ring Station Alarm Thresholds view, click the* ***Station Detail*** *button.*

This view includes three color-coded pie charts presenting a breakdown of token ring application statistics. Each statistic is presented as a total amount since the device was initialized, and as a percentage of overall traffic.

Station Address

The MAC address of the station for which the information in this table pertains.

Station Name

The ASCII name assigned to this station.

Station Port
The number of the port on the token ring module to which this station is connected.

Upstream
The MAC address of the device (neighbor) immediately upstream of the station on the ring.

Downstream
The MAC address of the device (neighbor) immediately downstream of the station on the ring.

Configure Station Alarms

Opens the Token Ring Station Alarms Configuration View, which allows you to change the threshold value and state of the station for the Line, Burst, A/C, Internal, and Receive Congestion errors.

Station Removal
Allows you to modify the removal state of the station and displays the last request made of the device. `Remove` causes the station to remove itself from the ring, `NotRemovable` disables removal from the ring, and `DoNotRemove` is the default setting and does not affect the station.

Station Priority
The station's maximum access priority.

Pie Charts

Table 24 through Table 26 list the statistics and definitions for each of the pie charts displayed in this view.

Table 24: Frame Breakdown Pie Chart

Statistic	Definition
Frames	The total frames detected on this station or ring.
Errors	The total errors detected by this station or ring.

Table 25: Non-Isolating Errors Pie Chart

Statistic	Definition
Lost Frames	The total number of times a station has had its Token Ring Rotation (TRR) timer expire trying to transmit.
Congestions	The total number of times a station recognizes a frame addressed to it, but the station has no available buffer space.
Frame Copied	The total number of times a station recognizes a frame addressed to it, and detects that the FS field A bits are set to 1.
Token	The total number of times the station acting as active monitor recognizes an error condition requiring a token be transmitted.
Frequency	The total frequency errors on this ring.

Table 26: Isolating Errors Pie Chart

Statistic	Definition
Line	The number of line errors that have occurred on this ring.
Burst	The number of burst errors that have occurred on this ring.
A/C	The number of address/copied errors that have occurred on this ring.
Abort Sequence	The number of abort sequences transmitted on this ring.
Internal	The number of internal errors detected by a station on this ring.

Station Alarms Dialog Box

Access: *From the Token Ring Station Alarm Threshold view, click the* ***Stations Alarms*** *button.*

The Station Alarms dialog box allows you to read, display, and modify the alarm settings for a single station or list of stations. The list displays the stations that were on the ring at the time the dialog box was opened. You can read and modify the settings to a valid station that does not appear in the list and was added after opening the view by entering its address in the Station field.

Station
The address of the current station. You can enter the address of a valid station in this field to make it the current station.

Alarm
The threshold alarms that can be manipulated. The alarms in this column include: `Line`, `Internal`, `Burst`, `A/C`, and `Congestion`.

Threshold
The current setting for each corresponding alarm threshold. You can change the values by selecting the field and editing the number.

State
The state of each corresponding alarm threshold. Valid values are: `Enable` or `Disable`.

Stations
The MAC addresses of all stations in the ring at the time the dialog box was opened except the current station, which is displayed in the **Apply Settings to** list. Double-clicking on an address in this list moves it to the **Apply Settings to** list.

Apply Settings to
The MAC addresses of all stations to which the threshold settings may be applied. This list always contains the current station's MAC address upon opening the dialog box. Double-clicking on an address in this list moves it to the **Stations** list.

Moves the selected item from the **Stations** list to the **Apply Settings to** list.

Moves the selected item from the **Apply Settings to** list to the **Stations** list.

Moves all of the stations from the **Stations** list to the **Apply Settings to** list. The current station remains at the top of the **Apply Settings to** list if it is a valid station.

Moves all of the stations from the **Apply Settings to** list to the **Stations** list. The current station remains at the top of the **Apply Settings to** list if it is a valid station.

Applies the threshold settings to the stations listed in the **Apply Settings to** list or the station entered into the **Station** field if the list is empty.

Read

Initiates a read of the threshold settings for the selected station or the station entered into the **Station** field.

Cancel

Exits the dialog box without applying settings to the stations or once you have applied all changes and wish to exit.

Modifying Threshold Settings

To change the threshold settings for one or more stations, follow these steps:

1. Move the addresses of all the stations to be modified to the **Apply Settings to** list. If you are only modifying the current station, this step is not necessary. If you wish to modify a valid station that does not appear in the list, enter its MAC address into the **Station** field. For information on how to move addresses between lists, refer to the buttons described earlier in this section.
2. Select the desired settings to be applied to the current station and all stations in the **Apply Settings to** list by clicking on **`Enable`** or **`Disable`** for each alarm threshold and typing a value into each **Threshold** field.
3. Click **Apply**.

If the new alarm thresholds cannot be written to the device due to the device being down, an error message appears and you should try again later.

Reading Thresholds from a Station

To read the current threshold settings from any station, follow these steps:

1. Select the station to be read from the **Stations** or **Apply Settings to** list. If you are reading from the current station, this step is not necessary. If you wish to modify a valid station that does not appear in either list, enter its MAC address into the **Station** field.
2. Click **Read**. The threshold settings for the selected station are read from the device.

Modify Allowed Station List View

Access: *Within Token Ring Security Configuration view, click the* ***Modify Allowed Station List*** *button*

This view allows you to modify the security for the ring by adding or removing stations from the ring's list of allowed stations.

Do not attempt to modify Ring Security without a complete understanding of Token Ring concepts. Removal of the station acting as the connecting bridge from the Ring Security Allowed Station List can cause isolation from the ring.

Security Administration State

This section allows you to choose the level of security for the ring. You may only select one option at a time. Click on the desired option to select it. The buttons indent to indicate the selected option.

Disable

Disables the ring security. All stations are allowed on the ring.

Enable with Alarm

Enables the ring security, and any station entering the ring will generate an alarm unless it is on the secure list. The device will place the station address on the Allowed Stations list.

Enable with Remove and Alarm

Enables the ring security, and any station not on the secure list that enters or currently resides on the ring will generate an alarm and be removed from the ring.

Allowed Stations

The list of stations currently allowed on the ring. Double-clicking on an item in the list moves it to the Disallowed Stations window. However, you cannot move a station from the Allowed Stations window if the security is set to **`Enable with Alarm`**. A symbol (>) indicates that this station has recently been moved to the Disallowed Stations window from the Allowed Station window, and will remain until the changes are applied.

Disallowed Stations

Acts as a scratch pad or buffer to store addresses currently disallowed on the ring, but you may want to move to the Allowed Stations window in the future. The ring does not read this buffer to deny ring access to certain stations, but rather denies access to all stations not explicitly listed in the Allowed Stations window. Double-clicking on an item in the list will move it to the Allowed Stations window. A symbol (<) indicates that this station has recently been moved to the Allowed

Stations window from the Disallowed Station window, and will remain until the changes are applied.

>

Moves the selected station from the Allowed Stations window to the Disallowed Stations window. A symbol (>) indicates that this station has recently been moved to the Disallowed Stations window from the Allowed Station window, and will remain until the changes are applied. You cannot move a station from the Allowed Stations window if the security is set to **Enable with Alarm**.

<

Moves the selected station from the Disallowed Stations window to the Allowed Stations window. A symbol (<) indicates that this station has recently been moved to the Allowed Stations window from the Disallowed Stations window, and will remain until the changes are applied.

ADD

Allows you to add a new station. The station address must be added in valid hex MAC address form, and valid separators are the colon (:), period (.), and dash (-). You can add the new station to either the Allowed or Disallowed Station window by selecting the appropriate option in the **ADD** Station dialog box. A symbol (+) indicates that this station has recently been added, and will remain until the changes are applied. Selecting a recently added and still marked (+) station and clicking **DELETE** will remove it from the window.

DELETE

Allows you to remove the selected station (refer to the *CAUTION* earlier in this section). You may remove any station address except that belonging to the device itself, or a station from the Allowed Stations window if the security is set to **Enable with Alarm**. A symbol (-) indicates that this station has been marked for removal, and will remain until the changes are applied, at which time the station is actually removed from the window. Selecting the station and clicking **ADD** will remove the symbol (-) and unmark the station for removal. This button will also remove a station marked with the symbol (+).

Delete All Allowed Stations

Allows you to remove all of the stations in the Allowed Stations window (refer to the *CAUTION* earlier in this section). A symbol (-) marks all of the items in the window, indicating that the stations have been designated for removal, and

will remain until the changes are applied, at which time the stations are actually removed from the window. This option will remove all station addresses except that belonging to the device itself. Selecting a station and clicking **ADD** will remove the symbol (-) and unmark that station for removal

Apply

Applies all changes made to the Allowed and Disallowed Stations windows, writing the list from the Allowed Stations window to the device and from the Disallowed Stations window to SPECTRUM, and removes all indicator markings from the modified stations.

Read

Updates the Allowed and Disallowed Stations windows by reading the saved values from both the device and SPECTRUM. This serves to reset any changes you made to either window but did not apply.

Cancel

Exits from the view. Only changes that have been applied will be saved.

Changing the Ring Security State

To change the level of ring security, follow these steps:

1. Click on the desired security option.
2. Click **Apply** and then select **OK** in the confirmation window.

If the new security state cannot be written to the device, a **Cannot Update** error message appears. There may be a problem contacting the device, or the firmware may not have updated. Click **Read** before attempting another update.

Adding Stations

To add stations to the view, follow these steps:

1. Click **ADD**. A pop-up dialog box appears.
2. Enter the station address in the text entry field following the guidelines described in the **ADD** button description.
3. Select the option corresponding to the list you want to add the station to (Allowed or Disallowed) and click **Apply**.

If the new station cannot be written to the device, a **Cannot Update** error message appears. There may be a problem contacting the device, or the address you are trying to add to the station's allowed list may already exist. Click **Read** before attempting another update.

ATM

This section provides a table of all ATM model types, the ATM Chassis icons associated with these model types, and general descriptions of the views that are available for the devices represented by these model types.

Overview

Below is a bulleted list of the main ATM views for the SmartSwitch 9000, and a brief description of each. For further details on ATM in see the ***ATM Ciruit Mangager Guide***.

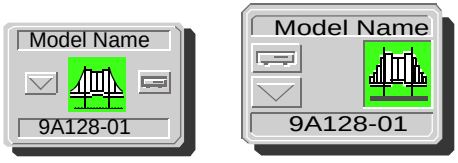
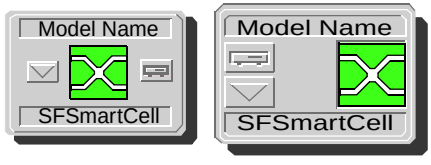
Table 27 represents all the ATM Devices available for the SmartSwitch 9000. In addition, Figure 24 provides an example of an ATM Chassis module icon and the views which can be accessed from it. This figure includes links to examples of the Icon Subview menus from which these same views can also be accessed.

- *ATM Client Application Configuration View* (Page 92). This view provides configuration information on the ATM Client Application.
- *ATM Interface Detail View* (Page 93). This view displays cell performance breakdown information for ATM.
- SFCS Configuration Views (Page 94). These views provide detailed information on each virtual switch contained within the device.
- SFCS Module Views (Page 97). These views provide information for each SFCS module contained within the device.
- *ANIM Configuration Table View* (Page 99). These views provide you with information on each ANIM contained within the device.
- SFCS IF Views (Page 100). These views provide detailed information on the switching interfaces contained within the device.
- SFCS Connection Views (Page 101). These views provide detailed information on all connections contained within the device.
- SFCS Queue Views (Page 103). These views contain detailed information about all the queues maintained within the device.

- SFCS CTM Views (Page 104). These views provide detailed information for the CTM backplane contained within the device.
- SFCS Bandwidth Management Views (Page 107). These views contain detailed information about bandwidth accessed and used by this device.

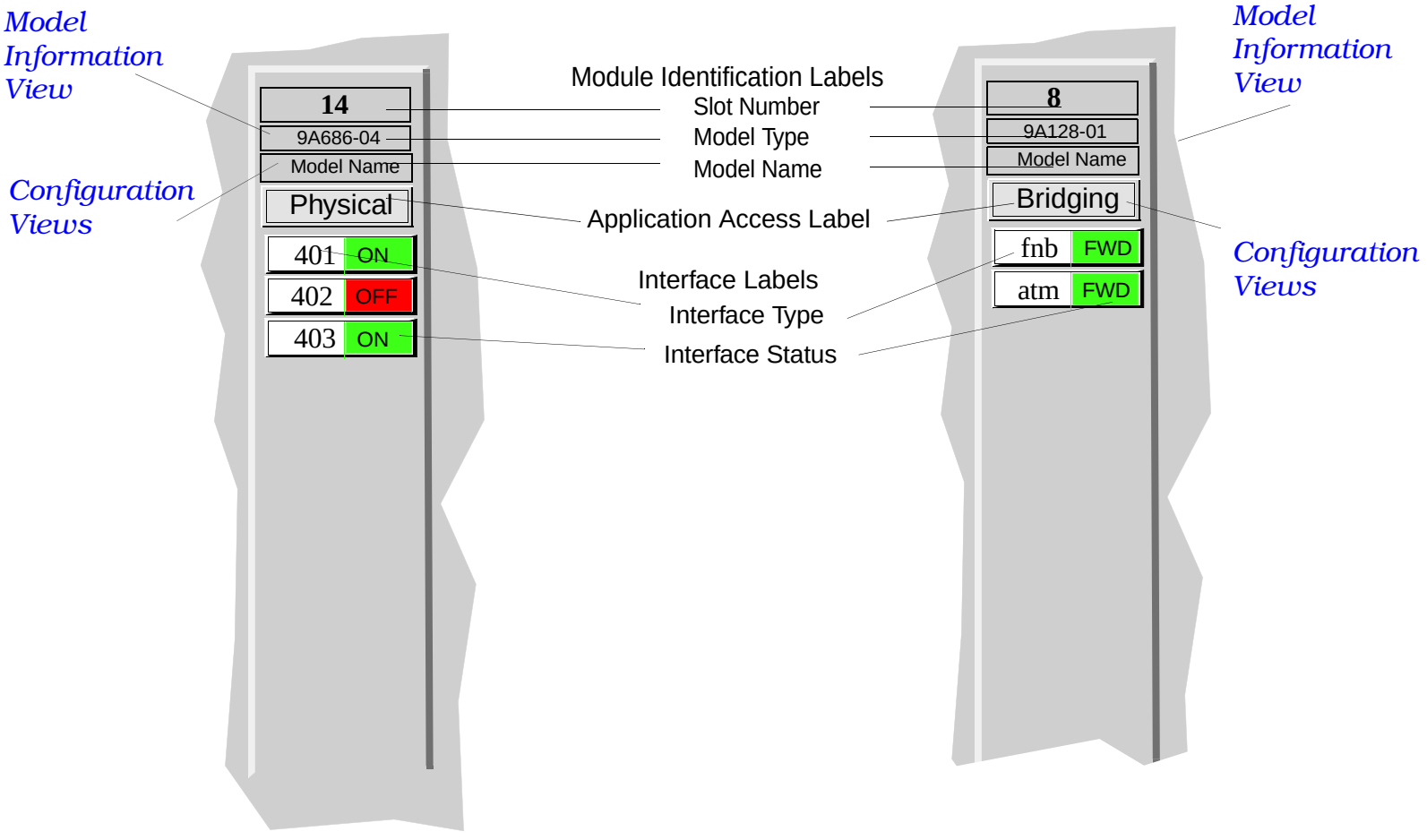
Note: The SFCS views are only accessible from the 9A656-04 and 9A686-04 models.

Table 27: ATM Model Types

Device	Model Type	Example Device Icon
9A000 Switch Module *	9A000	
9A128-01 Access Module-FNB	9A128-01	
9A426-01 Access Module-FNB and INB	9A426-01	
9A426-02 Access Module-FNB and INB	9A426-02	
9A656-04 SmartCell Switch	9A656-04	
9A686-04 SmartCell Switch	9A686-04	

* The 9A000 was developed for Cabletron by Fore Systems and is discussed in the ForeRunner ATM Switch.

Figure 24: ATM Chassis Module Icon



ATM Client Application Configuration View

Access: *Highlight the ATM Application Icon, and from the* ***Icon Subviews****, select* ***ATM Configuration****.*

This view provides configuration information on the ATM Client Application.

Configuration Table

Max VPCs (Virtual Path Connections)
The maximum number of VPCs supported at this ATM interface. At the UNI (User Network Interface), the maximum number of VPCs ranges from 0 to 256.

Max VCCs (Virtual Channel Connections)
The maximum number of VCCs supported at this ATM interface.

Conf VPCs
The number of VPCs configured for use at this ATM interface. At the UNI, the configured number of VPCs ranges from 0 to 256.

Conf VCCs
The number of VCCs configured for use at this ATM interface.

Max VPI (Virtual Path Identifier) Bits
The maximum number of active VPI bits configured for use at this ATM interface. At the UNI, the maximum number of active VPI bits configured for use ranges from 0 to 8.

Max VCI (Virtual Channel Identifier) Bits
The maximum number of active VCI bits configured for use at this ATM interface.

ILMI (Interim Local Management Interface) VPI
The VPI value of the VCC supporting the ILMI at this ATM interface. If the values of both ILMI VPI and ILMI VCI equal 0, then the ILMI is not supported.

ILMI VCI
The VCI value of the VCC supporting the ILMI at this ATM interface. If the values of both ILMI VPI and ILMI VCI equal 0, then the ILMI is not supported for this ATM interface.

Address Type
The type of primary ATM address configured for use at this ATM interface.

Admin Address
The address assigned for administrative purposes.

Neighbor Address
The IP address of the neighbor system at the far end of this interface to which a Network Management Station can access network management information.

Neighbor If Name
The name of the interface on the neighbor system at the far end of this interface, to which this interface connects. If the neighbor system is manageable through SNMP and supports the object ifName, the value of this object must be identical to that of the ifName for the ifEntry of the lowest level physical interface for this port. If this interface does not have a name, the value of this object is a zero length string.

ATM Interface Detail View

Access: *From the **Icon Subviews** menu for the ATM Interface Icon, select **Detail**.*

This view displays cell performance breakdown information for ATM as shown in Figure 25.

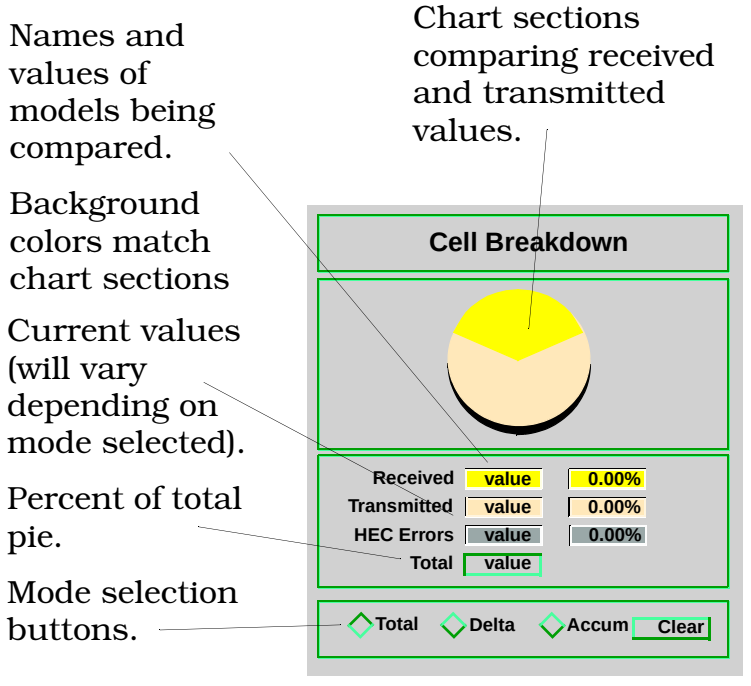
Received
The number of cells received by the switch.

Transmitted
The number of cells transmitted by the switch.

HEC Errors
The number of Header Error Control Errors.

Total
The total number of cells.

Figure 25: ATM Interface Detail View



SFCS System Configuration View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS System > Configuration**.*

This view contains information used to set up and configure each Virtual Switch. It contains the following information:

Admin Status
Sets the administrative state of the Secure Fast Cell Switching (SFCS) services for this virtual switch. This controls the SFCS state at a chassis level. Regardless of the per-interface state of each SFCS switching element and the state of active connections, writing the value `disabled` causes the entire switch to immediately shutdown.

Oper Status
The current operating condition of this switch. Possible values are described in Table 28.

Table 28: Operating Status Values

Value	Description
enabled	Running.
disabled	Not running.
pending-disable	Shut-down in progress.
pending-enable	Start-up in progress.
invalid-config	Not running, invalid configuration.
other	None of the above.

Oper Time
The amount of time that this switch system has been in its current operational state.

Last Change
The last time a change was made to the configuration entry for this switch.

Switch Capacity
The maximum capacity of the switch in megabytes.

Max Cnx Entries
The maximum number of connections which can be established on this switch.

Max Stat Entries
The maximum number of stats enabled VCs for this switch.

Max UPC Entries
The maximum number of UPC enabled VCs for this switch.

Firmware Version
The Firmware Version of the switch.

ANIM Count
The number of ATM Network Interface Modules (ANIMs) currently configured on this switch.

Interface Capability
The total bandwidth capability (transmit and receive) for this switch expressed in Mbps.

Type of Switch
Indicates what type of switch this is.

Policing Support
Indicates whether this switch supports policing.

CTM Slot Mask
The slot mask for all CTM boards in the chassis. The least significant bit represents slot 1.

PNNI NSAP Prefix
The 13-byte Network Server Access Point (NSAP) prefix to use with address registration.

PNNI Node Level
The PNNI node level value. The range can be from 0 to 104.

PNNI Addressing Mode
The PNNI addressing mode. Possible modes are listed in Table 29.

Table 29: PNNI Addressing Modes

Mode	Description
automode-MAC	Address configured automatically, based on MAC address.
automode-board	Address configured automatically, based on board number.
manual	Address configured manually.

PNNI Addressing Admin Status
The PNNI addressing administrative status. Valid values are: `Up` and `Down`.

SFCS System Status View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS System > Status**.*

This table contains the objects that pertain to the operational status of a Virtual Switch. It provides the following:

TDM Cell Count
The total number of cells being transferred across the Time Division Multiplexing (TDM) backplane for the entire switch.

Current UPC Entries
The current number of Usage Parameter Control (UPC) entries for this switch.

TDM Utilization
The total percentage of TDM utilization for the switch.

Current Stat Entries
The current number of statistics entries for this switch.

Current Connection Entries
The current number of connection entries for this switch.

SFCS System Configuration View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS System > System Configuration**.*

The following information pertains to the setup and configuration of the Virtual Switch.

Admin Reset
Resets this Virtual Switch. Writing a value of `reset` will force a restart of the entire switch, without any graceful shutdown. Any active connections or services will be interrupted.

ATOM Persistence
This enables or disables ATOM mib persistence.

VC Size
The size of Virtual Connections (VCs) allocated for all Virtual Paths (VPs) in the switch.

Power Up Diagnostics
Enables or disables power-up diagnostics.

Module Configuration Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Module > Configuration**.*

This table contains the configuration and administrative information for each SFCS module. It provides the following:

Slot
The primary index to the SFCS switch table. This identifies the chassis slot number for this switch module.

Admin Status
Sets the administrative state of the SFCS switching services for this SFCS module. This controls the SFCS state at a module level.

Oper Status
The current operating condition of the SFCS module.

Oper Time
The amount of time that this SFCS module has been in its current operational state.

Last Change
The last time a change was made to the configuration entry for this SFCS switch module.

SFCS MIB Version
The current version, expressed as an integer, of the SFCS MIB for this switch module.

SFCS MIB Rev
The current revision level of the Cabletron SFCS MIB for this switch module.

Switch Host Port
The switch port that is attached to the host.

Host Ctrl ATM Address
The ATM address of the host.

Switch Capacity
The maximum bandwidth based on the current configuration of the switch module.

Max Cnx Entries
The maximum number of connections which can be established on this switch module.

Max Stat Entries
The maximum number of stats enabled VCs for this switch module.

Max UPC Entries
The maximum number of UPC enabled VCs for this switch module.

Number of ANIMS
The number of ATM Network Interface Modules (ANIMs) currently configured on this switch module.

BW Capability
The total bandwidth capability for this switch engine, expressed in Mbps.

Module Status Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Module > Status**.*

This table contains the status information for each SFCS switch module. It provides the following:

Slot
The primary index to the SFCS switch table. This identifies the chassis slot number for this SFCS module.

TDM Cell Count
The total number of cells being transferred across the TDM backplane for this switch module.

TDM Utilization
The percentage of TDM utilization for this switch module.

Curr Cnx Entries
The current number of connection entries for this switch module.

Curr UPC Entries
The current number of UPC entries for this switch module.

Curr Stats Entries
The current number of statistics entries for this switch module.

Curr CTM Agent
The current board number.

Module UPC Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Module > Usage Parameter Control**.*

This table contains the Usage Parameter Control (UPC) information for this SFCS module. It provides the following:

Slot Index
The primary index to the SFCS switch table. This identifies the slot number for this SFCS module.

Admin Status
Sets the administrative state of the SFCS module's UPC engine.

Oper Status
The operational state of the SFCS module's UPC engine.

Oper Time
The amount of time that the UPC engine has been active for this switch module.

Reset
Resets the UPC engine for this SFCS module.

Statistics Engine Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Module > Statistics Engine**.*

This table contains information for the Statistics Engine for a particular switch module. It provides the following:

Slot Index
The primary index to the SFCS statistics engine table. This identifies the chassis slot number for this SFCS module.

Admin Status
Sets the administrative state of the SFCS switch statistics engine.

Oper Status
The operational state of the SFCS switch statistics engine for this switch module.

Oper Time
The amount of time that the SFCS switch statistics have been active for this switch module.

Reset
Resets the SFCS switch counters for this SFCS module. Writing a value of `reset` resets the SFCS switch counters to 0 and causes **`Oper Time`** to also be reset to "0."

ANIM Configuration Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS ANIM > Configuration**.*

This table contains the managed objects used to set up and configure each SFCS ANIM. It contains the following:

ANIM Index
The ATM Network Interface Module (ANIM) with which you are dealing.

Admin Status
Sets the administrative state of the SFCS switch ANIM.

Oper Status
The operational state of the SFCS switch ANIM for this SFCS ANIM instance.

ANIM Type
The type of physical interface for this ANIM.

Number of Ifs
The number of operational interfaces for this ANIM.

Line Rate
The line rate per port, in Mbps, for this ANIM.

ANIM Status Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS ANIM > Status**.*

This table contains the managed objects used to keep track of, transmit, receive counts and bandwidth for each SFCS ANIM.

ANIM Index
A unique value that specifies the ANIM with which you are dealing.

Rx Cells
The number of cells received from this ANIM's interfaces.

Tx Cells
The number of cells transmitted from this ANIM's interfaces.

Interface Configuration Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS IF > Configuration**.*

This table contains the managed objects used to set up and configure each SFCS switching interface.

If Index
The interface with which you are dealing.

Buffers Allocated
The number of cells in transmit buffer memory.

Queue Count
The number of priority queues configured on this interface.

Sig Stack Id
The user signaling stack ID for this interface.

Clocking From Mother Board
The ANIM clocking source from the mother board.

Clocking To Mother Board
The ANIM clocking source to the mother board.

Interface Statistics Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS IF > Statistics**.*

This table contains the objects that specify the packet and byte counters for each configured SFCS switching interface. It provides the following:

If Index
A unique value identifying the interface with which you are dealing.

Rx Errors
The number of receive path lookup invalid and out of range errors.

VPI Lookup Invalid Errors
Indicates the number of Virtual Path Identifier (VPI) lookup invalid and out of range errors.

Rx Cnx Lookup Invalid Errors
The number of receive connection lookup invalid errors.

Rx Cell Count
The number of receive cells on this interface.

Tx Cell Count
The number of transmit cells on this interface.

Overflow Dropped Cell Count
The number of cells that were dropped due to queue overflows.

Connection Configuration Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Connections > Configuration**.*

This table contains the connection configuration information.

Index
Displays a unique value used to identify this cross-connect.

Low If Index
The value of this object that is equal to the low MIB-II IfIndex value of the ATM interface port for this cross-connect.

Low VPI
The value of this object that is equal to the low VPI value at the ATM interface associated with the cross-connect that is identified by **Index**.

Low VCI
The value of this object that is equal to the low VCI value at the ATM interface associated with this cross-connect that is identified by **Index**.

High If Index
The value of this object that is equal to the high MIB II IfIndex value of the ATM interface port for this cross-connect.

High VPI
The value of this object that is equal to the high VPI value at the ATM interface associated with the cross-connect that is identified by **Index**.

High VCI
The value that is equal to the high VCI value at the ATM interface associated with this cross-connect that is identified by **Index**.

Type
The connection type for this VC.

TM Type
The type of traffic management used on this VC. Possible values are: `er`, `efci`, and `other`.

UPC Enable
Indicates whether UPC policing is enabled on this VC.

Stats Enable
Indicates whether statistics will be kept on this VC.

Stats Table Counter Size
The size of the drop counter for this VC.

Owner
The owner of this cross-connect. Possible values are: `other`, `own`, and `dontown`.

Connection Statistics Table

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Connections > Statistics**.*

This table contains the connection configuration information. It provides the following:

CC Index
The unique value used to identify this cross-connect.

CC Low If Index
The value of this object that is equal to the low MIB-II **IfIndex** value of the ATM interface port for this cross-connect.

CC Low VPI
The value of this object that is equal to the low VPI value at the ATM interface associated with the cross-connect that is identified by **Index.**

CC Low VCI
The value of this object that is equal to the low VCI value at the ATM interface associated with this cross-connect that is identified by **Index**.

CC High If Index
The value of this object that is equal to the high MIB-II **`IfIndex`** value of the ATM interface port for this cross-connect.

CC High VPI
The value of this object that is equal to the high VPI value at the ATM interface associated with the cross-connect that is identified by **`Index`**.

CC High VCI
The value of this object that is equal to the high VCI value at the ATM interface associated with this cross-connect that is identified by **`Index`**.

Lo to Hi Tx Cells
The Low to High transmitted cell count for this connection.

Lo to Hi Dropped Cells
The Low to High dropped cell count for this connection.

Lo to Hi Tagged Cells
The Low to High tagged cell count for this connection.

Hi to Lo Tx Cells
The High to Low transmitted cell count for this connection.

Hi to Lo Dropped Cells
The High to Low dropped cell count for this connection.

Hi to Lo Tagged Cells
The High to Low tagged cell count for this connection.

Queue Configuration Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Queue > Configuration**.*

This group contains the managed objects for maintaining SFCS queues.

If Index
The interface with which you are dealing.

Queue
The index that specifies the transmit queue with which you are dealing.

Size
The size of the transmit queue for this queue.

Bandwidth
The percentage of this interface's bandwidth, utilized by this particular queue.

Clp Drop Threshold
The queue level to start dropping cells with a Cell Loss Priority equal to one (CLP = 1). This level is expressed as the percentage of this queue's size.

Congestion Threshold
The level at which to consider this queue congested. This level is expressed as the percentage of this queue's size.

EFCI Low Threshold
The lower threshold used for EFCI for this queue. This level is expressed as the percentage of this queue's size.

RM Threshold
The RM queue threshold expressed as a percentage of the queue's size. When this level is hit, a management message is sent to the sender notifying it to slow down.

Queue Statistics Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Queue > Statistics**.*

This table contains the statistics information for all queues on the SFCS. It provides the following:

If Index
A unique value that identifies the interface with which you are dealing.

Queue
The index that specifies the queue with which you are dealing.

Tx Cells Discarded
The number of cells with CLP=1 that were discarded.

Tx Cells Dropped
The number of cells that overflowed the buffer.

Peak Level
The peak level since last read.

Tx Cells
The transmit cell count on a per queue basis.

CTM Interface Configuration Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS CTM > Interface Configuration**.*

This table contains the configuration information of each configured SHEMP interface. It provides the following:

If Index
The unique value that identifies which interface you are dealing with.

Type
Sets the type of interface access attribute for the SFCS interfaces. Possible attributes are described in Table 30.

Table 30: SFCS Attribute Types

Attribute	Description
accessPort	Allow single user or shared access and perform statistics and control.
networkPort	Equivalent to trunk ports with no access control.
hostManagement Port	Indicates the (virtual) port to which the (internal) management agent is attached.
hostControlPort	Indicates the port to redirect non-management packets.

Buffer Allocated
The number of cells in transmit buffer memory.

# of Queues
The number of priority queues configured on this interface.

Sig Stack Id
The user signalling stack ID for this interface.

Clocking From MB
The ANIM clocking from source. Possible values are: `generatedTransmitClock`, `channelRecoveredClock`, `systemMasterClock`, and `notSupported`.

Clocking To MB
The ANIM clocking to source. Possible values are: `generatedTransmitClock`, `channelRecoveredClock`, `systemMasterClock`, and `notSupported`.

CTM Interface Statistics Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS CTM > Interface Statistics**.*

This view contains the objects that specify the packet and byte counters for each configured SFCS switching interface.

If Index
A unique numeric value that identifies the interface you are dealing with.

Rx Errs
The number of receive path lookup invalid and out of range errors.

VPI Lookup Invalid Errs
The number of VPI lookup invalid and out of range errors.

Rx Cnx Lookup Invalid Errs
The number of receive connection lookup invalid errors.

Allocated Rx BW
The allocated receive bandwidth.

Allocated Tx BW
The allocated transmit bandwidth.

Rx Cell Count
The number of receive cells on this interface.

CTM Queue Configuration Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS CTM > Queue Configuration**.*

This table contains the CTM configuration information for all queues on the SFCS. It includes the following:

IF Index
A unique value that identifies the interface with which you are dealing.

Queue
The index that identifies the transmit queue with which you are dealing.

Size
The size of the transmit queue.

Bandwidth
The percentage of this interface's bandwidth utilized by this particular queue.

Clp Drop Threshold
The queue level to start dropping CLP=1 cells for this queue. This level is expressed as the percentage of this queue's size.

Congestion Threshold
The level at which to consider this queue congested. This level is expressed as the percentage of this queue's size.

EFCI Low Threshold
The lower threshold used for Explicit Forward Congestion Indication (EFCI) for this queue. This level is expressed as the percentage of this queue's size.

RM Threshold
The Remote Management (RM) queue threshold expressed as a percentage of the queue's size. When this level is hit, a management message is sent to the sender notifying it to slow down.

CTM Queue Statistics Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS CTM > Queue Statistics**.*

This view contains the statistics information for all queues on the SFCS.

If Index
A unique value that indicates which interface you are dealing with.

Queue
The index that identifies the queue with which we are dealing.

Tx CLP Cells Discarded
The number of cells with Cell Loss Priority equal to one (CLP=1) that were discarded for this queue.

Tx Cells Dropped
The number of cells that overflowed the buffer for this queue.

Peak Level
The peak level since last read for this queue.

Tx Cells
The transmit cell count on a per queue basis.

BW Manager NIM Information Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Bandwidth Manager > Nim Information**.*

This table contains information about the administrative status of the Network Information Module (NIM).

Nim Index
A unique value that identifies which NIM you are dealing with. This reference is in the same format as MIB II's Interface index.

Admin Status
The administrative status of this NIM.

BW Manager Port Information Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Bandwidth Manager > Port Pool Information**.*

This table contains the following information:

Port Index
This index identifies the port with which you are dealing.

Admin Status
The administrative status of this port.

Forward Physical Bandwidth
The forward physical bandwidth of the port measured in cells per second.

Reverse Physical Bandwidth
The reverse physical bandwidth of the port measured in cells per second.

BW Manager Port Pool Limits Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Bandwidth Manager > Port Pool Limits Information**.*

This table contains the following information:

Port Index
A unique numeric value that specifies which port you are dealing with.

Pool Index
This index specifies the Pool within the port that you are dealing with.

Max Allocated Bw Forward
Upper Limit for BW to be allocated in a forward direction. It defaults to the physical BW and is set by administrative action. Can not be set to a value greater than physical BW.

Max Allocated Bw Reverse
Upper Limit for BW to be allocated in a reverse direction. It defaults to the physical BW and is set by administrative action. This cannot be set to a value greater than physical BW

Bw Allocated Formula
Determines which of three formulas will be used for computing the amount of variable bandwidth

to be allocated. Possible values are listed in Table 31.

Table 31: BW Allocated Formula Values

Value	Description
0	Conservative: Allocates the full amount of variable bandwidth. This is the default value.
1	Moderate: Allocates approximately half of the variable bandwidth.
2	Liberal: Supports very aggressive allocation and should be used with caution.

Bw Constant
A ratio used in formulas for computing the amount of variable bandwidth to be allocated. Valid values are from 1 to 255, which is the numerator of a fraction whose fixed denominator is 256. Thus the value 255 is really 255/256 (the most conservative value); the value 1 is really 1/256 (the most liberal value); and the value 128 is really 128/256 (or 50%). The default value is 255.

BW Manager Port Pool Statistics Table View

Access: *From the **Icon Subviews** for a SFCS Device icon, select **SFCS Bandwidth Manager > Port Pool Statistics**.*

This table contains the following information:

Port
A unique value that specifies which Port you are dealing with

Pool
This index specifies the Pool within the Port that you are dealing with.

Cnx Count Forward
The current total number of calls in the forward direction.

Cnx Count Rev
The current total number of calls in the reverse direction.

Alloc Bw Fwd
The current amount of allocated bandwidth in the forward direction.

Alloc Bw Rev
The current amount of allocated bandwidth in the reverse direction.

Avail Bw Fwd
The current amount of available bandwidth in the forward direction.

Avail Bw Rev
The current amount of available bandwidth in the reverse direction.

Peak Bw Fwd
The peak amount of allocated bandwidth in the forward direction since the port was initialized or the switch was reset.

Peak Bw Rev
The peak amount of allocated bandwidth in the reverse direction since the port was initialized or the switch was reset.

BW Manager Port Pool Trap Management Table View

Access: *From the* ***Icon Subviews*** *for a SFCS Device icon, select* ***SFCS Bandwidth Manager > Port Pool Trap Management****.*

This table contains the following information:

Port
A unique value that specifies the port with which you are dealing.

Pool
This index specifies the Pool within the Port which you are dealing with.

Fwd Alloc Bw Upper
The upper threshold for the Alloc BW fwd trap. When an allocation causes the currently allocated bandwidth to exceed this value, a trap is generated.

Rev Alloc Bw Upper
The upper threshold for the Alloc BW revtrap. When an allocation causes the currently allocated bandwidth to exceed this value a trap is generated.

Fwd Alloc Bw Lower
The lower threshold for the Alloc BW fwd trap. When an allocation causes the currently allocated

bandwidth to fall below this value, a trap is generated.

Rev Alloc Bw Lower
The lower threshold for the Alloc BW rev trap. When an allocation causes a currently allocated bandwidth to fall below this value, a trap is generated.

Fwd Peak Bw
The upper threshold for the Peak BW fwd trap. When an allocation causes the currently allocated bandwidth to exceed this value, a trap is generated.

Rev Peak Bw
The upper threshold for the Peak BW rev trap. When an allocation causes the currently allocated bandwidth to exceed this value, a trap is generated.

Node Configuration Table View

Access: *From the **Icon Subviews** menu for the PNNI Application icon, select **Node Configuration**.*

This view contains the following information:

Index
The numerical sequence of the node.

Node Level
PNNI level of the node.

Admin Status
The administrative status of the node. Valid values are: `Up` or `Down`.

Peer Group Identification
A unique number identifying the peer group.

Node Identification
A unique number identifying the node.

PGL Election Information

Opens the *PGL Election Information View* (Page 112).

PGL Election Information View

Access: *From the Node Configuration Table View, select the* ***PGL Election Information*** *button.*

This view provides Peer Group Leader (PGL) election information for a PNNI node in the switching system. The following fields are provided.

Index
A consecutive number assigned to each item in the PGL Election table.

LeaderShipPriority
The leadership priority value this node should advertise in its nodal information group for the given peer group. Only the value 0 can be used with nodes that are not capable of being a PGL or Logical Group Node (LGN). If there is no configured parent node index or no corresponding entry in the PNNI Node Table, then the advertised leadership priority is 0 regardless of this value.

ParentIndex
The local node index used to identify the node that will represent this peer group at the next higher level of hierarchy, if this node becomes PGL. The value 0 indicates that there is no parent node.

NodelintTime
The number of seconds this node will delay advertising its choice of preferred PGL after having initialized operation and reaching the full state with at least one neighbor in the peer group.

Delay
The number of seconds a node will wait for itself to be declared the preferred PGL by unanimous agreement among its peers. In the absence of unanimous agreement, this will be the amount of time that will pass before this node considers a two-thirds majority as sufficient agreement to declare itself PGL, abandoning the attempt to get unanimous agreement.

ReElectTime
The number of seconds that this node will wait before starting the process of electing a new PGL after losing connectivity to the current PGL.

PGL State
The state that this node is in with respect to the PGL election that takes place in the node's peer group. The values are enumerated in the PGL state machine as listed below in Table 32.

Table 32: PGL States

1	starting	6	await unanimity
2	awaiting	7	operating
3	awaiting full	8	operation not PGL
4	initial delay	9	hung election
5	calculating	10	await re-election

PreferredPGL
The ID of the node that the local node believes should be or should become the PGL. This is also the value the local node is currently advertising in the preferred PGL Node ID field of its nodal information group within the given peer group. If a preferred PGL has not been chosen, the value is set to all zeros.

PGLeader
The ID of the node that is currently operating as PGL of the peer group this node belongs to. If a PGL has not been elected, the value is set to all zeros.

PGLTimeStamp
The system time at which the current PGL established itself.

ActiveParentID
The ID being used by the PGL to represent this peer group at the next higher level of the hierarchy. If this node is at the highest level of the hierarchy or if no PGL has been elected, the value is all zeros.

Nodal Map Information View

Access: *From the **Icon Subviews** menu for the PNNI Application icon, select **Node Statistics**.*

This view contains the following information:

Peer Group ID
Identifies the peer group of the originating node.

Parent Node ID
When the originating node is a peer group leader, this indicates the node ID of the parent LGN. If the originating node is not the peer group leader of its peer group, this attribute's value is set to (all) zero(s).

Parent Peer Group ID
When the originating node is a peer group leader, this indicates the node's parent peer group ID. If the originating node is not the peer group leader of its peer group, this attribute's value is set to (all) zero(s).

Node ATM Address
The ATM End System Address of the originating node.

Parent ATM Address
When the originating node is a peer group leader, this indicates the ATM address of the parent LGN. If the originating node is not the peer group leader of its peer group, this attribute's value is set to (all) zero(s).

Parent PGL Node ID
When the originating node is a peer group leader, this identifies the node elected as peer group leader of the parent peer group. If the originating node is not the peer group leader of its peer group, this attribute's value is set to (all) zero(s).

The Nodal Map Table contains the following fields.

NodeID
The node whose nodal information is being described.

Restricted
Indicates whether the originating node is restricted to only allow support of SVCs originating or terminating at this node. A value of `true` indicates that the transit capabilities are restricted, i.e., transit connections are not allowed. A value of `false` indicates that transit connections are allowed.

ComplexRep
Indicates whether the originating node uses the complex node representation. If the value is `true`, the spokes and bypasses that make up the complex node representation should be found in the PNNI Map Table.

RestrictedBranch
Indicates whether the originating node is able to support additional branches. If the value is `false`, then it can support additional branches.

DBOverload
Indicates whether the originating node is currently operating in a topology database overload state. Valid values are: `true` or `false`.

IAMLeader
Indicates whether the originating node claims to be PGL of its peer group. Valid values are: `true` or `false`.

LeaderPriority
The leadership priority value advertised by the originating node.

PreferredPGL
Identifies the node that the originating node believes should be or is PGL of its peer group. If the originating node has not chosen a preferred PGL, this field is all zeros.

Node Timer Information

Opens the *Nodal Timer Information View* (Page 115).

Svcc Variable Information

Opens the *SVCC Variable Information View* (Page 116).

Nodal Timer Information View

Access: *From the Nodal Map Information view, click the* ***Node Timer Information*** *button.*

This view provides nodal timer information in the following fields.

PTSE Hold
The initial value for the PNNI Topology State Element (PTSE) hold down timer that is used by the given node to limit the rate at which it can re-originate PTSEs. The value must be a positive non-zero number in units of 100 milliseconds.

HelloHoldDown
The initial value for the Hello hold down timer that is used by the given node to limit the rate at which it sends Hellos. The value must be a positive non-zero number in units of 100 milliseconds.

HelloInterval
The initial value for the Hello timer, in seconds. In the absence of triggered Hellos, this node will send one Hello packet on each of its ports on this interval.

Inactivity
The value for the Hello inactivity factor that this node will use to determine when a neighbor has gone down. The default value is `5`.

LinkInact
The number of seconds a node will continue to advertise a horizontal (logical) link for which it has not received and processed an LGN horizontal link information group. The default value is `120`.

Refresh
The initial value for the Refresh timer that this node uses to drive (re-)origination of PTSEs in the absence of triggered updates. The default value is `1800 seconds`.

LifetimeFactor
The value for the lifetime multiplier, expressed as a percentage. The result of multiplying the value for **Refresh** by this value is used as the initial lifetime that this node places into self-originated PTSEs.

RXInterval
The number of seconds between retransmissions of unacknowledged database summary packets, PTSE request packets, and PNNI Topology State Packets (PTSP). The default value is 5.

DlyActIntvl
The minimum amount of time between transmissions of delayed PTSE acknowledgment packets, in units of 100 milliseconds. The default value is 10.

AVCRPM
The proportional multiplier used in the algorithms that determine significant change for available cell rate (AvCR) parameters, expressed as a percentage. The default value is 50.

AVCRMt
The minimum threshold used in the algorithms that determine significant change for available cell rate (AvCR) parameters, expressed as a percentage. The default value is 3.

CDVPm
The proportional multiplier used in the algorithms that determine significant change for cell delay variation (CDV) metrics, expressed as a percentage. The default value is 25.

CtDPm
The proportional multiplier used in the algorithms that determine significant change for cell transfer delay (CTD) metrics, expressed as a percentage. The default value is 50.

SVCC Variable Information View

Access: *From the Nodal Information Map Information view, click the* ***SVCC Variable Information*** *button.*

This view provides Switched Virtual Channel Connection (SVCC) information as follows.

Index
The index value for the node.

InitTime
The time, in seconds, this node delays establishing an SVCC to a neighbor with a numerically lower ATM address after determining that such an SVCC should be established. The default value is 4.

RetryTime
The time, in seconds, this node delays before attempting to re-establish an apparently still necessary and viable SVCC-based RCC after it is unexpectedly torn down. The default value is 30.

CallingIntegTime
The time, in seconds, this node waits for an SVCC it initiated as the calling party to become fully established before giving up. The default value is 35.

CalledIntegTime
The time, in seconds, this node waits for an SVCC it decided to accept as the called party to become fully established before giving up and tearing it down. The default value is 50.

TrafficDescIndex
An index in the ATM Traffic Descriptor Parameter Table defined in RFC 1695. The descriptor is used when creating switched VCs used as SVCC-based RCCs to and from PNNI logical group nodes.

Interface Views

Table 33 lists each of the menu options and views available via the **Interface** option on the Switch Application Icon Subviews menu.

Table 33: Interface Options and Views

Option	Accesses the...
Configuration	*ATM Interface Configuration View* (Page 118).
TC Sublayer	*TC Sublayer Table View* (Page 119).
DS3 PLCP	*DS3 PLCP Table View* (Page 120).

ATM Interface Configuration View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **Interface > Configuration**.*

This view provides the following information on the local interface configuration parameters for each ATM interface or port.

If Index
The interface number.

Max VPCs
The maximum number of VPCs (PVC and SVC) supported by the ATM interface.

Max VCCs
The maximum number of VCCs (PVC and SVC) supported by this ATM interface.

Conf VPCs
The number of VPCs currently in use on this ATM interface. This includes the number of PVCs and SPVCs that are configured on the interface, plus the number of SVCs that are currently established on the interface.

Conf VCCs
The number of VCCs currently in use on this ATM interface. This includes the number of PVCs and SPVCs that are configured at the interface plus the number of SVCs that are currently established on the interface.

Max VPI Bits
The maximum number of active VPI bits configured for use at the ATM interface.

Max VCI Bits
The maximum number of active VCI bits configured for use on the ATM interface.

ILMI VPI
The VPI value of the VCC supporting the Interim Local Management Interface (ILMI) on the ATM interface. If this value and the value of **ILMI VCI** are 0, then ILMI is not supported on this interface.

ILMI VCI
The VCI value of the VCC supporting the ILMI at the ATM interface. If this value and the value of **ILMI VPI** are 0, then ILMI is not supported on this interface.

Address Type
The type of ATM address, such as `private`.

Admin Address
An address assigned for administrative purposes, e.g., an address associated with the service provider side of a public network UNI.

Neighbor Address
The IP address of the neighbor system connected to the far end of this interface to which an NMS can send SNMP messages.

Neighbor If Name
The textual name of the interface of the neighbor defined in the **Neighbor Address** field.

TC Sublayer Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **Interface > TC Sublayer**.*

This view provides the following Transmission Convergence (TC) sublayer alarm and event information.

IF Index
The interface number.

OCD Events
The number of times the Out of Cell Delineation (OCD) events occur. An OCD event occurs when seven consecutive ATM cells have Header Error Control (HEC) violations. A high number of OCD events may indicate a problem with the TC sublayer.

TC Alarm State
Indicates if there is an alarm present for the TC sublayer. `Failure` indicates that a Loss of Cell Delineation (LCD) state has been declared for the TC sublayer. Transition from `Failure` to `No Alarm` occurs when six consecutive ATM cells are received with a valid Header Error Check (HEC), followed by about 10 seconds of acceptable signal.

DS3 PLCP Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **Interface > DS3 PLCP**.*

This view provides the following Physical Layer Convergence Protocol (PLCP) statistics information.

IF Index
The interface number.

SEFSs
The number of DS3 PLCP SEFSs (Severely Errored Framing Seconds). Each SEFS represents a one-second interval that contains one or more severely errored frame events.

Alarm State
Indicates whether the DS3 PLCP has received an incoming alarm (yellow) signal. The value `IncomingLOF` means that the DS3 PLCP has declared a Loss of Frame (LOF) failure condition. The value `No Alarm` means that there are no alarms present. The transition from an LOF failure to a no alarm state occurs when no defect has been received for more than 10 seconds.

UASs
The counter associated with the number of “unavailable” seconds encountered by the PLCP.

Cross Connect Views

Table 34 lists the menu options and views available via the **Cross Connect** option on the Switch Application Icon Subviews menu.

Table 34: Cross Connect Options and Views

Option	Accesses the...
Virtual Channels	*VC Cross Connect Table View*.
Virtual Paths	*VP Cross Connect Table View* (Page 122).

VC Cross Connect Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **Cross Connect > Virtual Channels**.*

This view provides the following configuration and state information for bi-directional VC cross connects. The terms low and high represent numerical ordering of the two interfaces associated with a cross connect (from low to high VPC traffic flow and from high to low VPC traffic flow). The view provides read-create access, which is used to create and remove connections. The Index is used to associate the related VCLs that are cross connected together.

Index
A unique value identifying the VC cross connect.

Low Index
The index value for the ATM interface for this VC cross connect, which is numerically lower than the Index value of the other ATM interface.

Low VPI
The VPI value at the ATM interface associated with the VC cross connect that is identified by **Low Index**.

Low VCI
The VCI value at the ATM interface associated with the VC cross connect that is identified by **Low Index**.

High Index
The index value for the ATM interface for this VC cross connect, which is numerically higher than the index value of the other ATM interface.

High VPI
The value equal to the VPI value at the ATM interface associated with the VC cross connect that is identified by **High Index**.

High VCI
The value equal to the VCI value at the ATM interface associated with the VC cross connect that is identified by **High Index**.

Admin Status
The desired administrative status of this bi-directional VC cross connect. `Up` indicates that the traffic flow is enabled on this VC cross connect. `Down` means it is disabled.

L2H Oper Status
The current operational status (`Up` or `Unknown`) of the VC cross connect in one direction (i.e., from the low to high direction).

H2L Oper Status
The current operational status of the VC cross connect in one direction (i.e., from the high to low direction). `UP` indicates that this ATM VC cross connect from the high to low direction is operational. `Unknown` indicates that the state cannot be determined.

L2H Last Change
The value of **Sys Up Time** (located in the Banner area of the view) at the time this VC cross connect entered its current operational state in the low to high direction. If the current state was entered prior to the last re-initialization of the agent, the value is 0.

H2L Last Change
The value of **Sys Up Time** at the time this VC cross connect entered its current operational state in the high to low direction. If the current

state was entered prior to the last re-initialization of the agent, the value is 0.

Row Status
The status of this entry in the Cross Connect Table. This is used to create new VCL cross connects that are created using the VCL Table, or to change and delete existing cross connects.

VP Cross Connect Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **Cross Connect > Virtual Paths**.*

This view provides configuration and state information for all point-to-point, point-to-multipoint, and multipoint-to-multipoint VP cross connects. The view provides read-create access, which can be used to cross connect the VPLs together in an ATM switch or network. The index is used to associate the related VPLs that are cross connected together.

Index
The unique value to identify this VP cross connect.

Low Index
The value for the low interface Index of the ATM interface for this VP cross connect.

Low Vpi
The value equal to the VPI value at the ATM interface associated with the VP cross connect that is identified by **Low Index**.

High Index
The value for the high interface Index of the ATM interface for this VP cross connect.

High Vpi
The value equal to the VPI value at the ATM interface associated with the VP cross connect that is identified by **High Index**.

Admin Status
The desired administrative status of this bi-directional VP cross connect. `Up` indicates that the traffic flow is enabled on this VP cross connect.

L2H Oper Status
Identifies the current operational status (`Up` or `Unknown`) of the VP cross connect in one direction (i.e., from the low to high direction).

H2L Oper Status
The current operational status (`Up` or `Unknown`) of the VP cross connect in one direction (i.e., from the high to low direction).

L2H Last Change
The value of **Sys Up Time** at the time this VP cross connect entered its current operational state in the low to high direction. If the current state was entered prior to the last re-initialization of the agent, the value is 0.

H2L Last Change
The value of **Sys Up Time** at the time this VP cross connect entered its current operational state in the high to low direction. If the current state was entered prior to the last re-initialization of the agent, the value is 0.

Row Status
The status of this entry in the Cross Connect Table. This is used to create VPL cross connects that are created using the VPL Table or to change and delete existing cross connects.

Links Views

Table 35 lists the menu options and views available via the **Links** option on the Switch Application Icon Subviews menu.

Table 35: Links Options and Views

Option	Accesses the...
Virtual Channels	*Creating PVCs and PVPs*,.
Virtual Paths	*Virtual Path Link Table View* (Page 126).

The Virtual Channel Link Table view is used to create PVCs and the Virtual Path Link Table view is used to create PVPs. See *Creating PVCs and PVPs* before attempting to perform these tasks.

Creating PVCs and PVPs

The procedures for creating a Permanent Virtual Channel (PVC) and Permanent Virtual Path (PVP) are identical. You accomplish both by using views accessible from the SwitchApp Icon Subviews menu, as described below. Basically, you use Virtual Channel views to create PVCs and Virtual Path views to create PVPs.

The following procedure describes how to create a PVC. To create a PVP, use the Virtual Path views instead of the Virtual Channel views.

Creating a PVC involves defining individual links (VPI/VCI) on each of two ports and then cross connecting the ports. Use the *Virtual Channel Link Table View* (Page 125) to define the links on each port; then use the *VC Cross Connect Table View* (Page 120) to cross connect the ports.

Note:

Check the following before you begin:

1. You must have write privileges for the device.
2. The traffic parameters for the ports must be set properly.
3. The ILMI parameters must be set. Use local management to do this.

4. From the SwitchApp Icon Subviews menu, select **Links -> Virtual Channel**.

   The *Virtual Channel Link Table View* (Page 125) displays.

5. Set the link information (IF Index, VPI, and VCI). For example, **`20101.0.160`**.

6. Save the link by pressing <Return> and then clicking **Create Link**.

   The VCL Row Status view displays.

7. Assign traffic parameters for transmit and receive and then click <Return> to save.

8. Click **Validate Row** and then wait to see that the row status changes from `Not Ready` to `Active`.

9. Return to the Virtual Channel Link Table view to validate that the link was defined with the assigned traffic parameters.

10. That completes the link definition for the first port to be cross connected. Now repeat steps 1 through 6 to complete the link definition for the other port.

11. When the links are defined correctly for both ports, go to the SwitchApp Icon Subviews menu and select **Cross Connect -> Virtual Channels**.

The *VC Cross Connect Table View* (Page 120) displays.

12 Follow the instructions in this view to cross connect the two ports for which you defined links. Cross connecting establishes the PVC.

Note: You should return to the Virtual Channel Link Table view to ensure that the PVC has been set properly.

Virtual Channel Link Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **Links > Virtual Channels**.*

This view provides the following configuration information for the Virtual Channel Links (VCLs).

IF Index
The interface number

VPI
The VPI value of the VCL.

VCI
The VCI value of the VCL.

Admin Status
The desired administrative state of the VCL. `Up` indicates that the traffic flow is enabled; `Down` means disabled. (This field is used only for a VCL that terminates a VCC, i.e., one that is not cross connected to other VCLs.)

Oper Status
The current operational status of the VCL. `Up` means that the VCL is currently operational; `Down` means not operational. `Unknown` means that the status cannot be determined.

Last Change
The value of **Sys Up Time** at the time this VCL entered its current operational state. If the

current state was entered prior to the last re-initialization of the agent, the value is 0.

Rcv Descr Index
The row in the ATM Traffic Descriptor Table that applies to the receive direction of this VCL.

Xmit Descr Index
The row of the ATM Traffic Descriptor Table that applies to the transmit direction of this VCL.

Cross Connect Id
Implemented only for a VCL that is cross connected to other VCLs that belong to the same VCC. All such VCLs have the same value, which is reflected in the *VC Cross Connect Table View* (Page 120).

Row Status
Used to create, delete, or modify a row in this table. Follow the procedure given in the view to make a change.

Virtual Path Link Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **Links > Virtual Paths**.*

This view provides the following configuration information for the virtual path links.

IF Index
The interface number.

VPI
The VPI value of the Virtual Path Link (VPL). Note that a VPI value of 0 is not used for a VPL not associated with a VCL. The maximum VPI value cannot exceed the value allowable by the interface's maximum VPI.

Admin Status
The desired administrative state of the VPL. `Up` indicates that the traffic flow is enabled for this VPL. `Down` means disabled. (This field is used only for a VPL that terminates a VPC, i.e., one that is not cross connected to other VPLs.)

Oper Status
The current operational status of the VPL. Valid values are: `Up`, `Down`, or `Unknown`.

Last Change
The value of **Sys Up Time** at the time this VPL entered its current operational state. If the

current state was entered prior to the last re-initialization of the agent, the value is 0.

Rcv Descr Index
The row in the Traffic Parameter Table that applies to the receive direction of the VPL.

Xmit Descr Index
The row in the Traffic Parameter Table that applies to the transmit direction of the VPL.

Cross Connect Id
Implemented only for a VPL that is cross connected to other VPLs that belong to the same VPC. All such VPLs have the same value, which is reflected in the VP Cross Connect Table.

Row Status
Used to create, delete, or modify a row in this table. Use the procedure given in the view to make a change.

Traffic Parameter Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **Traffic Parameter**.*

This view lets you create and modify traffic parameters or descriptors using the instructions given in the view. This should be done before creating PVCs and PVPs. The view contains the following fields.

Index
Used by the Virtual Link Table (VPL or VCL Table) to identify the row of this table.

Descr Type
Type of ATM traffic descriptor. The type may indicate no traffic descriptor or a traffic descriptor with one or more parameters. These parameters are specified as a parameter vector in the corresponding instances of Param 1, Param 2, Param 3, Param 4, and Param 5.

Param 1, 2, 3, 4, or 5
Parameter of the ATM traffic descriptor used according to the value of **Descr Type.**

QoS Class
A value identifying one of four QoS classes specified in the ATM Forum UNI specification as follows:

- 1 = Service Class A, Constant Bit Rate and is used for video and circuit emulation.
- 2 = Service Class B, Variable Bit Rate and is used for video and audio.
- 3 = Service Class C and is used for connection-oriented data transmission.
- 4 = Service Class D and used for connectionless data transmission. An unspecified QoS (value 0) is used for "best-effort" traffic.

Row Status
Used to specify the state of the row in this table. The possible states are: `Active`, `Not in service`, `Not ready`, `Create and go`, `Create and wait`, and `Destroy`.

ILMI Network Prefix Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **ILMI Network Prefix**.*

This table specifies per-interface network prefix(es) supplied by the network side of the UNI during ILMI address registration. When no network prefixes are specified for a particular interface, one or more network prefixes based on the switch address(es) may be used for ILMI address registration.

Interface
Information about a single network prefix supplied by the network side of the UNI during ILMI address registration.

Network Prefix
The network prefix specified for use in ILMI address registration.

Row Status
Used to create, delete, activate and de-activate network prefixes used in ILMI address registration.

VCL Statistics Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **VCL Statistics**.*

This table contains all statistics counters per VCL. It is used to monitor the usage of the VCL in terms of incoming cells and outgoing cells.

Interface
The interface number.

VCL VPI
The VPI value of the VCL.

VCL VCI
The VCI value of the VCL.

Total Cells In
The total number of valid ATM cells received by this VCL including both CLP=0 and CLP=1 cells. The cells are counted prior to the application of the traffic policing.

Clp0 Cells In
The number of valid ATM cells received by this VCL with CLP=0. The cells are counted prior to the application of the traffic policing.

Total Discards
The total number of valid ATM cells discarded by the traffic policing entity. This includes cells originally received with CLP=0 and CLP=1.

Total Cells Out
The total number of valid ATM cells transmitted by this VCL. This includes both CLP=0 and CLP=1 cells.

Clp0 Cells Out
The total number of valid ATM cells transmitted with CLP=0 by this VCL.

Tagged Outs
The total number of valid ATM cells tagged by the traffic policing entity from CLP=0 to CLP=1 and transmitted by this VCL.

Switched Virtual Channel Cross Connect Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **SVC VC Cross Connect**.*

The ATM SVCC Cross-Connect table. A bi-directional VC cross-connect between two switched VCLs is modeled as one entry in this table. A Soft PVCC cross-connect, between a soft permanent VCL and a switched VCL, is also modeled as one entry in this table.

Index
A unique value to identify this SVCC cross-connect.

Low IF
The value of this object is equal to the ifIndex value of the ATM interface port for this SVCC cross-connect. The term low implies that this ATM interface has the numerically lower ifIndex value than the other ATM interface identified in the same atmSvcVcCrossConnectEntry.

Low VPI
The value of this object is equal to the VPI value associated with the SVCC cross-connect at the ATM interface that is identified by atmSvcVcCrossConnectLowIfIndex. The VPI value cannot exceed the number supported by **High VPI** at the low ATM interface port.

Low VCI
The value of this object is equal to the VCI value associated with the SVCC cross-connect at the ATM interface that is identified by atmSvcVcCrossConnectLowIfIndex. The VCI value cannot exceed the number supported by **High VCI** at the low ATM interface port.

High IF
The value of this object is equal to the ifIndex value for the ATM interface port for this SVCC cross-connect. The term high implies that this ATM interface has the numerically higher ifIndex value than the other ATM interface identified in the same atmSvcVcCrossConnectEntry.

High VPI
The value of this object is equal to the VPI value associated with the SVCC cross-connect at the ATM interface that is identified by atmSvcVcCrossConnectHighIfIndex. The VPI value cannot exceed the number supported by the atmInterfaceMaxVpiBits at the high ATM interface port.

High VCI
The value of this object is equal to the VCI value associated with the SVCC cross-connect at the ATM interface that is identified by atmSvcVcCrossConnectHighIfIndex. The VCI value cannot exceed the number supported by the atmInterfaceMaxVciBits at the high ATM interface port.

Created Time
The value of the sysUpTime object at the time this bi-directional SVCC cross-connect was created. If the current state was entered prior to the last re-initialization of the agent, then this object contains a zero value.

Row Status
This object is used to delete rows in the atmSvcVcCrossConnectTable.

Signalling Monitoring Table View

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **Signalling Monitoring**.*

SSCOP Table

This table displays the following information:

Interface

The interface number.

SSCOP Connection Events

SSCOP Connection Events Counter. This counter counts the sum of the following errors:

- **SSCOP Connection Disconnect Counter**. The abnormal occurrence of this event is characterized by the expiry of Timer_NO_RESPONSE.
- **SSCOP Connection Initiation Failure**. This condition indicates the inability to establish an SSCOP connection. This event occurs whenever the number of expiries of the connection control timer (Timer_CC) equals or exceeds the MaxCC, or upon receipt of a connection reject message BGREJ PDU.
- **SSCOP Connection Re-Establ/Resynch**. This event occurs upon receipt of a BGN PDU or RS PDU.

SSCOP Errored PDUs

SSCOP Errored PDUs Counter. This counter counts the sum of the following errors:

- Invalid PDUs. These are defined in SSCOP and consist of PDUs with an incorrect length (MAA-ERROR code U), an undefined PDU type code, or that are not 32-bit aligned.
- PDUs that result in MAA-ERROR codes and are discarded.

Detected Events Table

This table displays the following information:

Interface

The interface number.

Call Setup Attempts

Call Setup Attempts Counter. This counter counts the number of call setup attempts (both successful and unsuccessful) detected on this interface.

Routes Unavailable

Number of Route Unavailability detected on this interface. This counter is incremented when a RELEASE, RELEASE COMPLETE (only when not preceded by a RELEASE message for the same call), ADD PARTY REJECT, or STATUS message that contains one of the following cause code

values is received. See Table 36 for applicable cause values and meanings:

Table 36: Routes Unavailable

Cause Value	Meaning
1	Unallocated (unassigned) number.
2	No route to specified transit network.
3	No route to destination.

Resources Unavailable

Number of Resource Unavailability detected on this interface. This counter is incremented when a RELEASE, RELEASE COMPLETE (only when not preceded by a RELEASE message for the same call), ADD PARTY REJECT, or STATUS message that contains one of the following cause code values is received. See Table 37 for applicable cause values and meanings. (Note: These cause values apply to both UNI3.0 and UNI3.1 unless otherwise stated):

Table 37: Resources Unavailable

Cause Value	Meaning
35	Requested VPCI/VCI not available.
37	User cell rate not available (UNI3.1 only).

Table 37: Resources Unavailable

Cause Value	Meaning
38	Network out of order.
41	Temporary failure.
45	No VPCI/VCI available.
47	Resource unavailable, unspecified.
49	Quality of Service unavailable.
51	User cell rate not available (UNI3.0 only).
58	Bearer capability not presently available.
63	Service or option not available, unspecified.
92	Too many pending add party requests.

Called Party

Number of Called Party Responsible For Unsuccessful Call detected on this interface. This counter is incremented when a RELEASE, RELEASE COMPLETE (only when not preceded by a RELEASE message for the same call), ADD PARTY REJECT, or STATUS message that contains one of the following cause code values is received. See Table 38 for applicable cause values and meanings. (Note: These cause values apply to both UNI3.0 and UNI3.1):

Table 38: Called Party

Cause Value	Meaning
17	User busy.
18	No user responding.
21	Call rejected.
22	Number changed.
23	User rejects all calls with calling line identification restriction (CLIR).
27	Destination out of order.
31	Normal, unspecified.
88	Incompatible destination.

Note: Cause Value #30 'response to STATUS ENQUIRY' was not included in this memo since it did not apply to a hard failure.

Message Errors

Number of Incorrect Messages detected on this interface. The Incorrect Messages Counter reflects any sort of incorrect information in a message. This includes:

- RELEASE, RELEASE COMPLETE, ADD PARTY REJECT, and STATUS messages transmitted, that contain any of the Cause values listed below.
- Ignored messages. These messages are dropped because the message was so damaged that it could not be further processed.

A list of dropped messages is compiled below:

- Message with invalid protocol discriminator
- Message with errors in the call reference I.E.
  - Bits 5-8 of the first octet not equal to '0000'
  - Bits 1-4 of the first octet indicating a length other than 3 octets
  - RELEASE COMPLETE message received with a call reference that does not relate to a call active or in progress
  - SETUP message received with call reference flag incorrectly set to 1
  - SETUP message received with a call reference for a call that is already active or in progress.
- Message too short

The following cause values are monitored by this counter. See Table 39 for applicable cause values and meanings. (Note: These cause values apply to both UNI3.0 and UNI3.1 unless otherwise stated):

Table 39: Message Errors

Cause Value	Meaning
10	VPCI/VCI unacceptable (UNI3.0 only).
36	VPCI/VCI assignment failure (UNI3.1 only).
81	Invalid call reference value.
82	Identified channel does not exist.
89	Invalid endpoint reference.
96	Mandatory information element is missing.
97	Message type non-existent or not implemented.
99	Information element non-existent or not implemented.
100	Invalid information element contents.
101	Message not compatible with call state.
104	Incorrect message length.
111	Protocol error, unspecified.

Calling Party

Number of Calling Party Events detected on this interface. This counter monitors error events that occur due to the originating user doing something wrong. This counter is incremented when a RELEASE, RELEASE COMPLETE (only when not preceded by a RELEASE message for the same call), ADD PARTY REJECT, or STATUS message that contains one of the following cause code values is received. See Table 40 for applicable cause values and meanings. (Note: These cause values apply to both UNI3.0 and UNI3.1):

Table 40: Calling Party

Cause Value	Meaning
28	Invalid number format (address incomplete).
43	Access information discarded.
57	Bearer capability not authorized.
65	Bearer capability not implemented.
73	Unsupported combination of traffic parameters.
78	AAL parameters cannot be supported (UNI3.1 only).
91	Invalid transit network selection.
93	AAL parameters cannot be supported (UNI3.0 only).

Timer Expired
Number of Timer Expiries detected on this interface. The Timer Expiries Counter provides a count of network timer expiries, and to some extent, host or switch timer expiries. The conditions for incrementing this counter are:

- Expiry of any network timer
- Receipt of a RELEASE or RELEASE COMPLETE message with Cause #102, 'recovery on timer expiry'.

Restarts
Number of Restart Activity errors detected on this interface. The Restart Activity Counter provides a count of host, switch, or network restart activity. This counter is incremented when receiving a RESTART message.

Incoming SVC VCCs Established
Number of SVC VCCs established at this signalling entity for incoming connections.

Transmitted Events Table

Interface
The interface number.

Call Setup Attempts
Call Setup Attempts Counter. This counter counts the number of call setup attempts (both successful and unsuccessful) transmitted on this interface.

Routes Unavailable
Number of Route Unavailability transmitted from this interface. This counter is incremented when a RELEASE, RELEASE COMPLETE (only when not preceded by a RELEASE message for the same call), ADD PARTY REJECT, or STATUS message that contains one of the following cause code values is transmitted. See Table 36 (Page 132) for applicable cause values and meanings.

Resources Unavailable
Number of Resource Unavailability transmitted from this interface. This counter is incremented when a RELEASE, RELEASE COMPLETE (only when not preceded by a RELEASE message for the same call), ADD PARTY REJECT, or STATUS message that contains one of the following cause code values is transmitted. See Table 37 for applicable cause values and meanings.

Called Party
Number of Called Party Responsible For Unsuccessful Call transmitted from this interface. This counter is incremented when a RELEASE, RELEASE COMPLETE (only when not preceded by a RELEASE message for the same call), ADD PARTY REJECT, or STATUS message that contains one of the following cause code values is

transmitted. See Table 38 for applicable cause values and meanings.

NOTE: For this counter, RELEASE COMPLETE messages that are a reply to a previous RELEASE message and contain the same cause value, are redundant (for counting purposes) and should not be counted.

Note: Cause Value #30 'response to STATUS ENQUIRY' was not included in this memo since it did not apply to a hard failure.

Message Errors

Number of Incorrect Messages transmitted on this interface. The Incorrect Messages Counter reflects any sort of incorrect information in a message. This includes:

- RELEASE, RELEASE COMPLETE, ADD PARTY REJECT, and STATUS messages transmitted or received, that contain any of the Cause values listed below.
  - Ignored messages. These messages are dropped because the message was so damaged that it could not be further processed.

A list of dropped messages is compiled below:

- Message with invalid protocol discriminator
- Message with errors in the call reference I.E.
  - Bits 5-8 of the first octet not equal to '0000'
  - Bits 1-4 of the first octet indicating a length other than 3 octets
  - RELEASE COMPLETE message received with a call reference that does not relate to a call active or in progress
  - SETUP message received with call reference flag incorrectly set to 1
  - SETUP message received with a call reference for a call that is already active or in progress.
- Message too short

The following cause values are monitored by this counter. See Table 39 (Page 134) for applicable cause values and meanings.

Calling Party

Number of Calling Party Events transmitted from this interface. This counter monitors error events that occur due to the originating user doing something wrong. This counter is incremented when a RELEASE, RELEASE COMPLETE (only when not preceded by a RELEASE message for the same call), ADD PARTY REJECT, or STATUS message that contains one of the following cause

code values is transmitted. See Table 40 for applicable cause values and meanings.

Timer Expired

Number of Timer Expiries transmitted from this interface. The Timer Expiries Counter provides a count of network timer expiries, and to some extent, host or switch timer expiries. The conditions for incrementing this counter are:

- Expiry of any network timer
- Receipt of a RELEASE or RELEASE COMPLETE message with Cause #102, 'recovery on timer expiry'.

Restarts

Number of Restart Activity errors transmitted from this interface. The Restart Activity Counter provides a count of host, switch, or network restart activity. This counter is incremented when transmitting a RESTART message.

Outgoing SVC VCCs Established

Number of SVC VCCs established at this signalling entity for outgoing connections.

ATM Link Modeling Options

Access: *From the **Icon Subviews** menu for the Switch Application icon, select **ATM Link Modeling Options**.*

This view lets you control the creation of VCL (Virtual Channel Link) and VPL (Virtual Path Link) models. Clicking on the **Option Explanations** button will display information on the buttons and fields in this view and show you how to force a link model reconfiguration.

Use the **Create Link Models** button to customize how models are created or destroyed for the device. Normally, both VPL and VCL models are created at the same time when the device is configured. This view gives you the option of creating VPL, VCL, or both models as needed.

Setting the **Create Link Models** button and the **Create VCL Models** button to `True` causes SPECTRUM to create both VCL and VPL models. You may set the **Config Interval** field in order to setthe intervals between link configurations. If the **Create Link Model** button is set to `False`, neither model will be created.

Below are detailed instructions on how to create and destroy VCL and VPL models.

Creating VPL/VCL Models

1. Model the device that contains the ATM application.
2. Proceed to the Application view and find the ATM application icon.
3. Right-click the icon and select **ATM Link Modeling Options.** You may select the **Option Explanations** button to display instructions on screen.
4. Set both **Create Link Models** and **Create VCL Models** buttons to `True`. Save the change.
5. Click the **Reconfigure Now** button. This will create both VPL and VCL models.

If you set **Create Link Models** to `True` but **Create VCL Models** to `False` VCL models will not be created during the reconfiguration.

6. Launch your Device Topology view.
7. Locate the port number associated with the ATM applicaton.
8. Go to the port's Sub-Interface view.

   You will see the VPL/VCL models after the reconfiguration is completed.

Destroying VPL/VCL Models

1. In the ATM Link Modeling Options view set the **Create Link Models** button to `False`.
2. Save the changes.
3. Click the **Reconfigure Now** button. The VPL/VCL models will be destroyed during the reconfiguration.
4. Launch the Device Topology view.
5. Locate the port associated with the ATM Application.
6. Go to the Sub-Interface view of the port.

   You should not see the VPL/VCL models after the reconfiguraton is completed.

Ethernet

This section provides a table of all the Ethernet models and their associated model types, and the Ethernet Chassis icons associated with these model types.

Overview

Table 41 represents all the Ethernet Devices available for the SmartSwitch 9000. An example of an Ethernet Chassis module icon and the views available from it can be found in *Device View* (Page 20).

Note: This section does not contain detailed explanations of any views because all of the views available to Ethernet, Fast Ethernet, and Gigabit Ethernet are described in other SPECTRUM documentation or covered in this manual within another technology section.

Table 41: Ethernet Model Types

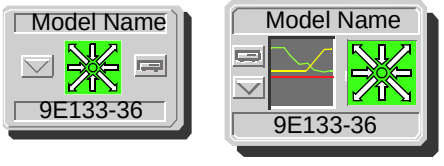
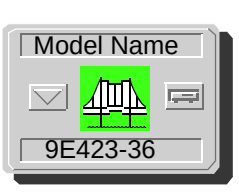
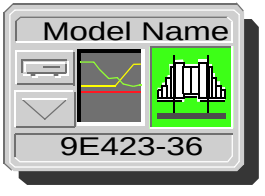
Device	Model Type	Example Device Icon
9E132-15 MicroLAN Switch Extension Module	9E132-15	
9E133-36 MicroLAN Switch Module - TP	9E133-36	
9E138-12/36 MicroLAN Switch Module - Fiber	9E138-12/36	

Table 41: Ethernet Model Types

Device	Model Type	Example Device Icon
9E106-06 Ethernet SmartSwitch Module	9E106-06	 
9E423-36 Ethernet SmartSwitch Module	9E423-36	
9E428-12/30 Ethernet SmartSwitch Module	9E428-12/30	
9E429-12/36 Ethernet SmartSwitch Module	9E428-12/36	
9E531-24 Ethernet Dual INB	9E5xx	
9H423-28 SmartSwitch 10/100 Module	9H423-28	
9H421-12 Fast Ethernet SmartSwitch Module	9H421-12	
9H422-12 Fast Ethernet SmartSwitch Module	9H422-12	
9H429-12 Fast Ethernet SmartSwitch Module	9H429-12	
9H423-26 SmartSwitch 10/100 Module	9H423-26	
9G421-02 Gigabit Ethernet SmartSwitch Module	9G421-02	
9H531-17 Fast Ethernet Dual INB	9H5xx	
9H531-18 Fast Ethernet Dual INB	9H5xx	
9H531-24 Fast Ethernet Dual INB	9H5xx	
9H532-17 Fast Ethernet Dual INB	9H5xx	
9H532-18 Fast Ethernet Dual INB	9H5xx	
9H532-24 Fast Ethernet Dual INB	9H5xx	
9H533-24 Fast Ethernet Dual INB	9H5xx	
9H539-24 Fast Ethernet Dual INB	9H5xx	
9G536-04 Gigabit Ethernt Dual INB	9G5xx	

Modeling Considerations

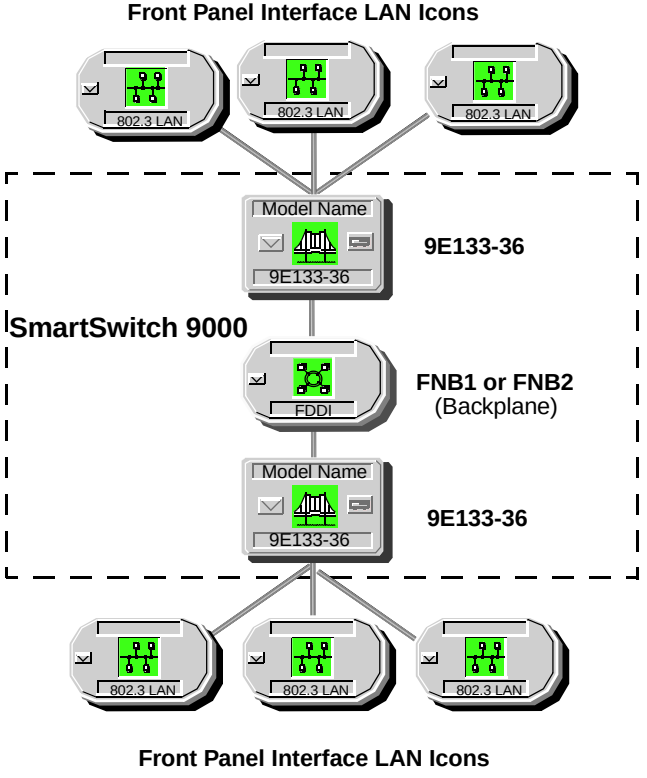
Some conditions apply concerning the placement (modeling) of model types within SPECTRUM views. The following restrictions apply:

- Ethernet devices can be modeled in the Universe Topology view or an 802.3 LAN Topology view
- Token Ring devices can only be modeled in an 802.5 LAN Topology view
- FDDI devices can only be modeled in an FDDI LAN Topology view

Example of a Modeled Network Topology View

Figure 26 shows an example of a 9E133-36 Ethernet MicroLAN Switch Modules and their network connections as displayed in the Topology view in SPECTRUM.

Figure 26: SmartSwitch 9000 Topology



Modeling Using the Model Type SmSwChasCont

You can also model the modules in a Chassis Container using the model type **SmSwChasCont**. This is a container that is modeled in the Universe view to contain the devices in a given chassis. These devices must be manually modeled in the container or cut and pasted into the Topology view for this container.

The advantage of using the SmSwChasCont model type is that it allows you to group all of your devices in a given chassis into one view, and takes the clutter out of the Universe view.

To navigate down into the Chassis Container SS9000 Topology view, simply double-click the down arrow on the SmSwChasCont icon.

Note: You must use the model type, SmSwChasCont. You cannot model by IP address as it is not an actual device.

Figure 27: Chassis Container

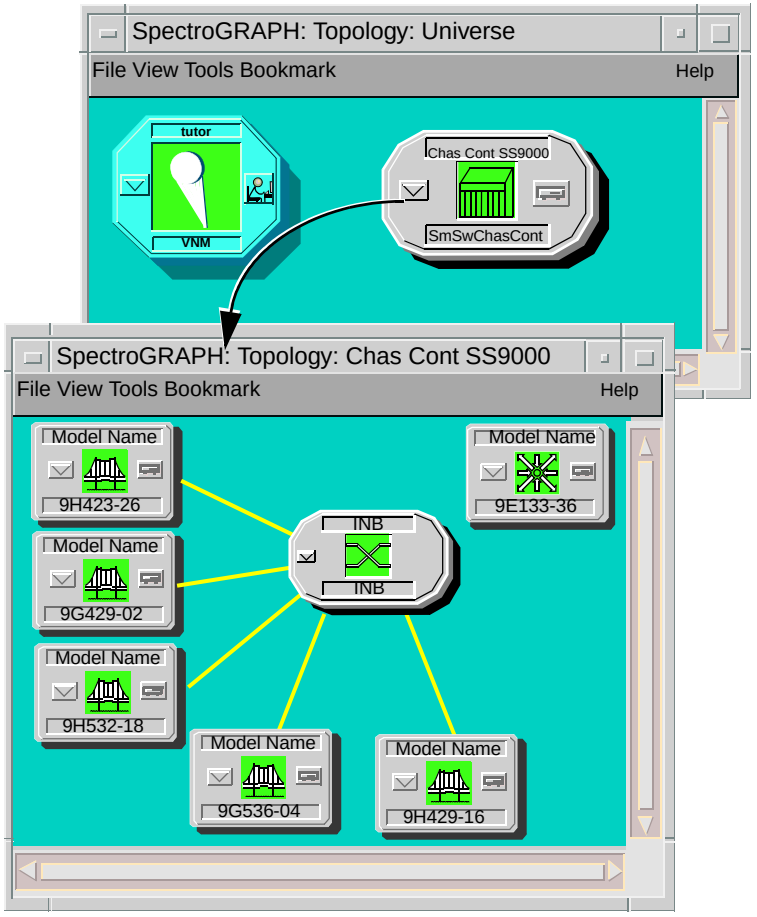


Table 42 lists the Icon Subviews menu available from the Chassis Container Device icon. These views are specific to using the SmSwChasCont model type and allow for a central place for all chassis information to be accessed.

Table 42: Icon Subviews menu for Chassis Container

Option	Accesses the...
Topology	Opens the Topology View, which contains the SmartSwitch modules that the user has placed/modeled in the container.
Chassis Applications	Opens the *Model Information View* (Page 50).
Device > Chassis	Opens the *Chassis Device View* (Page 24).

Manual Modeling

This section details how to manually model your network.

Summary

Modeling the SmartSwitch 9000 chassis manually in SPECTRUM involves modeling one of the modules contained within the chassis, locating the SmartSwitch 9000 Location icon in the Lost and Found View, creating a Room Location View and copying the SmartSwitch 9000 Location icon to the Room Location View. From the SmartSwitch 9000 Location View icon you can access the views available for the SmartSwitch 9000 Chassis.

Modeling the modules contained in the SmartSwitch 9000 can be done using AutoDiscovery (refer to the ***AutoDiscovery User's Guide***) or manually as described in this chapter.

The SmartSwitch 9000 is managed through the icons and views that represent the modules it contains, the Flexible Network Buses (FNB1 and FNB2), the INB, the Environmental Module (EM), and the front panel interfaces.

Preparation and Topology View Definitions

Before modeling the SmartSwitch 9000, you should be familiar with SPECTRUM's functions as described in the Administration and Operation documentation. You should be familiar with any network management and hardware requirements described in the SmartSwitch 9000 hardware documentation. You will also need to know the IP addresses, MAC addresses, and chassis positions of the modules contained within the SmartSwitch 9000 chassis. A worksheet is provided, for your convenience, to be used during the modeling of your SmartSwitch 9000 and the modules it contains. Use this worksheet to identify the IP address, MAC address, module type, and position of each module. This information will be used to model the modules contained within the SmartSwitch 9000 chassis.

For the purpose of this chapter, the Topology Views are defined as follows:

- **Topology View** refers to the view that the FDDI LAN (backplane), other networks (front panel interfaces), and some modules are modeled in
- **FDDI LAN Topology View** refers to the view that contains the FddiMAC models that represent the connections to the FNB

Modeling the Chassis

The SmartSwitch 9000 chassis is modeled indirectly using one of the modules it contains. Model one of the modules contained within the chassis as follows:

1. Using a copy of the worksheet provided (Table 43) identify the modules contained in the SmartSwitch 9000 to be modeled.
2. Select one of the modules listed on the worksheet.
3. Refer to *Modeling the Modules in the Chassis* (Page 149) section and model the selected module.

Once the first module has been modeled and an icon representing that module exists, the Chassis icon is automatically created and placed in the Lost &Found View.

Table 43: SmartSwitch 9000 Module Identification Worksheet

ChassisPosition	Module Type	IP Address	MAC Address
Example	9F116-01	192:168:123:45	00:00:12:34:56:78
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

Placing the Chassis Location Icon in the Location View

The Chassis Location icon must be copied into a Room Location View to allow access to the views available from the Location icon. Create a Room Location View as follows:

1. From the **View** menu select **New View > Location**.
2. From the **File** menu select **Edit > New Model**.
3. Select the desired location (Building, Country, etc.) from the Select Model Type dialog box. Click **OK**.
4. Enter a Name for the Location View created and a Security String (optional) in the Creating Location dialog box. Click **OK**.
5. When the icon appears in the Location View, exit the Edit mode.
6. Double-click the icon to open its Location View.
7. Repeat steps 3 through 8 until the Select Model Type dialog box lists the Room Location model type. Create the Room Location model.
8. Locate the Chassis icon in the Lost & Found View as follows:
   a. Select **New View** from the **View** menu.
   b. Select **Lost & Found** from the **New View** menu.
9. Copy the Chassis Location icon into the Room View as follows:
   a. From the Lost & Found View, select **Edit** from the **File** menu.
   b. Select the MMACPlus model type and select **Copy** from the **Edit** menu.
   c. Go back to the Room Location View and select **Edit** from the **File** menu.
   d. Select **Paste** from the **Edit** menu and exit the edit mode.
   e. Return to the Lost & Found View and click the right mouse button to exit the Edit mode. Click the right mouse button to exit the Lost & Found View.

Modeling the Modules in the Chassis

The following instructions are used to manually model modules in the SmartSwitch 9000. The "Quick Steps" are intended to provide a basic understanding of the process as well as a quick reference for modeling the modules. For more detailed instructions for modeling modules in the SmartSwitch 9000, refer to the procedures following the "Quick Steps." To model the modules in the SmartSwitch 9000 using **AutoDiscovery**, refer to the ***AutoDiscovery User's Guide***.

Quick Steps

1 In the Topology view, create an FDDI LAN model to represent the FNB (FNB1 or FNB2).

Note:

Some modules cannot be modeled in the Universe Topology view. If you attempt to model a module that cannot be modeled at this level, you will get an error message. This indicates that the module must be modeled in the FDDI LAN Topology View described in step 3.

2 In the Topology view, model the modules that can be modeled at this level (from the worksheet) that are connected to the FNB (FNB1 or FNB2) you modeled in step 1.

3 Open the FDDI LAN Topology view and model the modules (from the worksheet) that must be modeled at this level (refer to the *Modeling the Chassis* (Page 146) section).

4 If you have RingView for FDDI installed, copy at least one model's FddiMAC Application icon into the FDDI LAN Topology view and select **Current View Information** from the Icon Subviews menu. Model the ring using the procedures described in the ***RingView for FDDI User's Guide***.

5 If you do not have RingView for FDDI installed, copy the FddiMAC or GenFDDIMAC Application icon for each module's model into the FDDI LAN Topology view.

6 Position the FddiMAC or GenFddiMAC icons in a ring in the order described in the Station List for one of the FddiMACs.

7 Connect the FddiMAC or GenFddiMAC icons by drawing pipes between the adjacent icons in the ring.

8 Resolve the adjacent FddiMAC Off-Page Reference icons in the Device Topology views.

Modeling the Flexible Network Bus (FNB)

Model an FDDI LAN to represent the FNB (FNB1 or FNB2) as follows:

1. In the Topology View, select **Edit** from the **File** menu.
2. Select **New Model...** from the **Edit** menu.
3. Select **FDDI** from the Select Model Type dialog box. Click **OK**.
4. Enter a Name for the FNB to be created and a Security String (optional) in the Creating FDDI dialog box. Click **OK**.
5. Click the right mouse button to exit the edit mode.

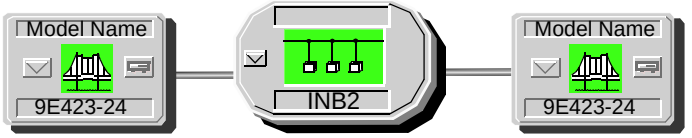
Modeling the Modules Connected to the INB

When modules that are connected to the INB are modeled, the INB is represented by an INB icon. This icon will appear automatically when two or more models are created in SPECTRUM. Model each device using the New Model... or New Model By IP... options. For modeling instructions for those devices also connected to the FNB, refer to *Modeling the Modules Connected to the FNB*. The following modules may be connected to the INB within the SmartSwitch 9000:

- 9F426-08
- 9E423-24

The INB icon representing the physical connection to the INB will appear as shown below

Figure 28: Modeling Modules Connected to the INB



Modeling the Modules Connected to the FNB

Some modules are modeled in the Topology view that contains the FDDI LAN, while others are modeled in the FDDI LAN Topology view (within the FDDI LAN model). The following modules must be modeled in a FDDI LAN Topology view:

- 9F120-08
- 9F122-12
- 9F125-08
- 9F241-12

1. In the Topology view, model the modules listed in the worksheet that are connected to the FNB as follows:
   a. Select **Edit** from the **File** menu.
   b. Select **New Model By IP...** (used for example) from the **Edit** menu.
   c. Enter the Network (IP) Address (from the work sheet) and the Community String (optional) for the module you wish to model. Click **OK**.
   d. Click on the model's icon with the left mouse button and position the model with respect to the FDDI LAN icon.
   e. Repeat steps b through d until all appropriate modules are modeled at this level. Click the right mouse button to exit the edit mode.
2. Double-click the Topology Arrow on the FDDI LAN to open the FDDI Topology view. Model the modules listed in the worksheet not modeled in the Topology view, that are connected to the FNB as follows:
   a. In the FDDI Topology view, select **Edit** from the File menu.
   b. Select **New Model By IP...** (used for example) from the Edit menu.
   c. Enter the Network (IP) Address (from the work sheet) and the Community String (optional) for the module you wish to model. Click **OK**.
   d. Click on the model's icon with the left mouse button and position the model.
   e. Repeat steps b through d until all remaining modules are modeled in this view.
   f. Position the model icons at the top left corner of the FDDI LAN Topology view.
   g. Exit Edit mode.

Building the FNB Ring in the FDDI LAN Topology View

The FNB ring displays the FDDI Media Access Controller (FddiMAC) models or GenFddiMAC models representing the connection to the FNB ring on the backplane. To model the ring automatically use the procedure described in the ***RingView for FDDI User's Guide***. To build a ring manually you must copy the FddiMAC or GenFddiMAC Application icons from each module's Application view into the FDDI LAN Topology view as follows:

1. From either the Topology view or the FDDI LAN Topology view, highlight a model icon and select **Application** from the **Icon Subviews** menu or double-click the Application view Label.
2. Copy the FddiMAC Application Icon from the Application view as follows:
   a. Select **Edit** from the **File** menu.
   b. Highlight the FddiMAC Application Icon.
   c. Select **Copy** from the **Edit** menu.
   d. Exit Edit mode and the Application View.
3. From the Topology view, click the Topology Arrow on the FDDI LAN icon to open the FDDI LAN Topology view.
4. Paste the FddiMAC Application icon into the FDDI LAN Topology View as follows:
   a. Select **Edit** from the **File** menu.
   b. Select **Paste** from the **Edit** menu.
   c. Drag the FddiMAC or GenFDDIMAC icon to position it in a ring.
   d. Exit Edit mode.
5. Repeat steps 1 through 4 until all modules have a FddiMAC or GenFDDIMAC icon in the FDDI LAN.

Known Anomalies

This section describes any known anomalies affecting Smartswitch 9000/9500 series devices in SPECTRUM.

Table 44: Known Anomalies: Smartswitch 9000/9500 Series Devices

Description	Solution
For some SmartSwitch 9000 modules, error messages can appear when you try to save created entries within the Static Bridging application's Static Bridging table. For example, the 9E133_36, 9E138_36, 9E423_24, and 9F310_02 models display the following: `Update failed for the following attributes: Attribute 0x1194c - Attribute doesn't exist on device,0x200000a`	For the Static Bridging table to work, a MacAddr.receiveport entry must be provided as follows: 1. Click Create Static Database Entry. 2. Confirm the MacAddr.receive value's existence 3. Click Close and then Save. This saves the MAC address as a static database entry, and the error message does not appear.
You may have difficulty creating and removing Permanent Virtual Circuits (PVCs) and Permanent Virtual Paths (PVPs) from SmartCell 9A656-04 and 9A686-04 devices.	Use the Virtual Channel views available for your device to create PVCs, and the Virtual Path views to create PVPs. The creation procedures are the same. Creating a PVC involves defining individual links (VPI/VCI) on each of two ports and then cross-connecting the ports. Use a Virtual Channel Link view to define the links on each port and then use a Cross Connect view to cross connect the ports. Before you begin, ensure that you have write privileges for the device, set the proper traffic parameters for the ports, and set the ILMI parameters using local management.

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